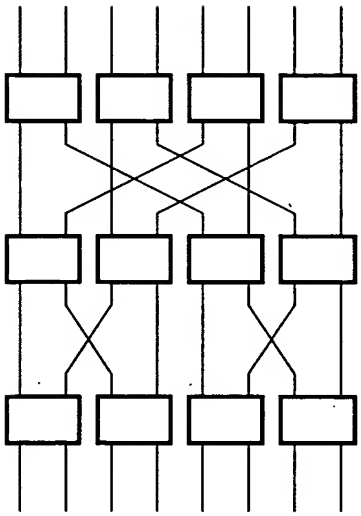

FIG. 1A (Prior Art)

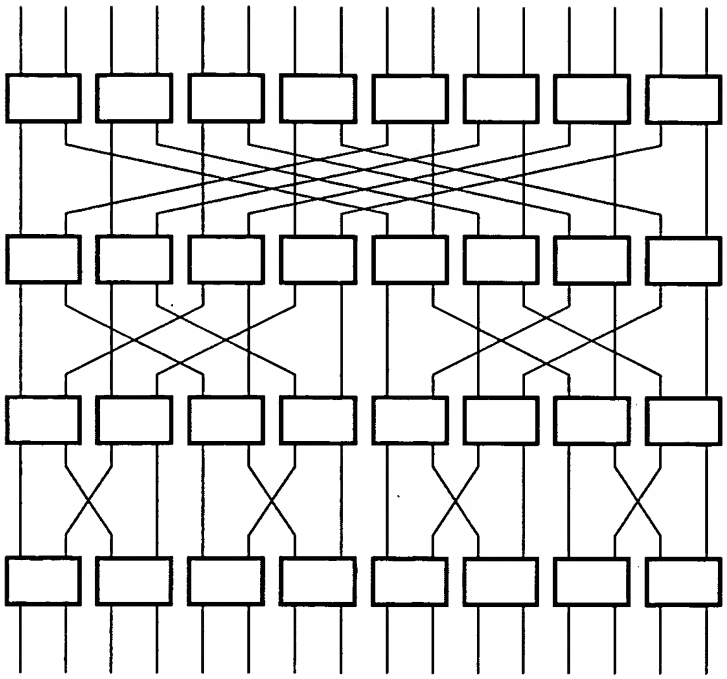

FIG. 1B (Prior Art)

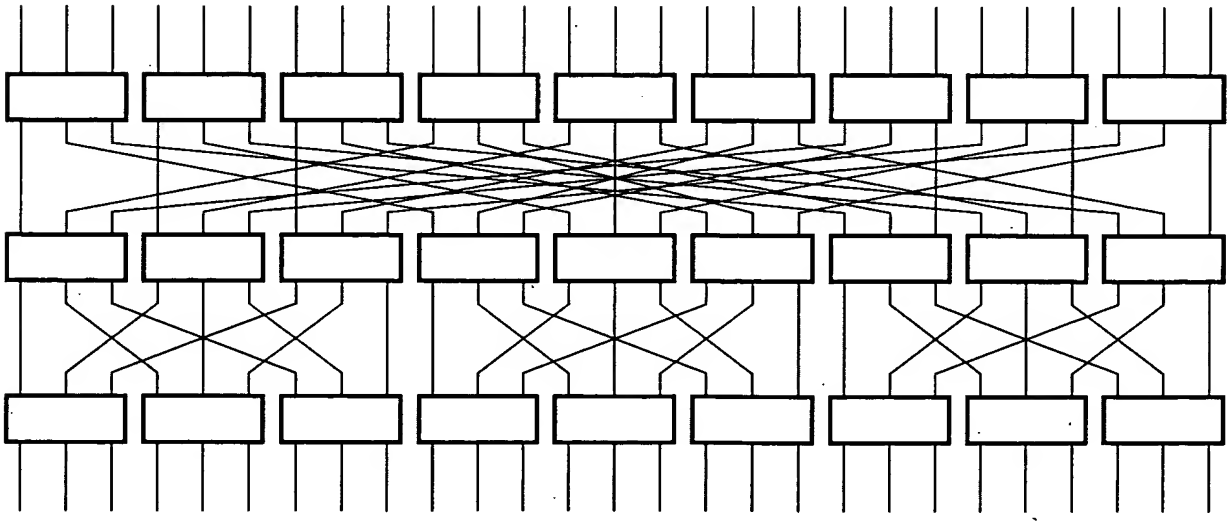

FIG. 1C (Prior Art)

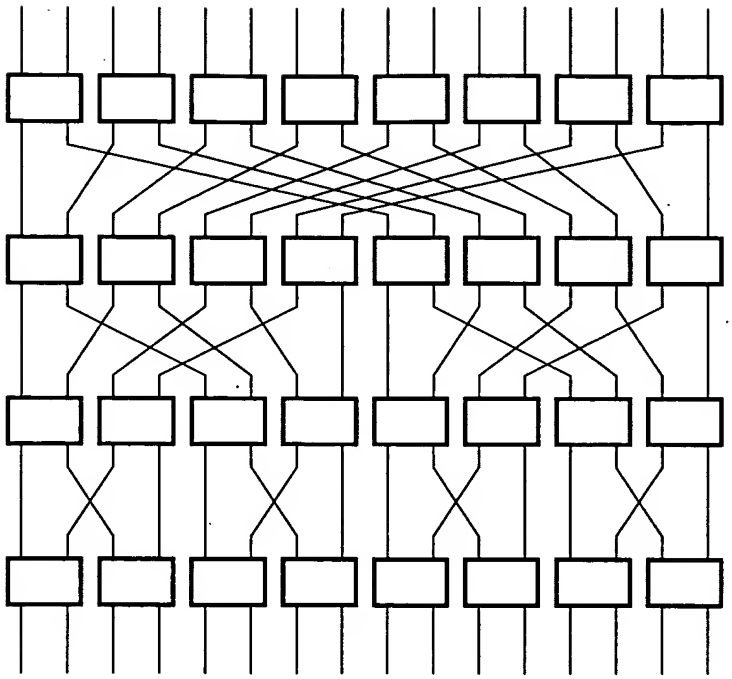

FIG. 1D (Prior Art)

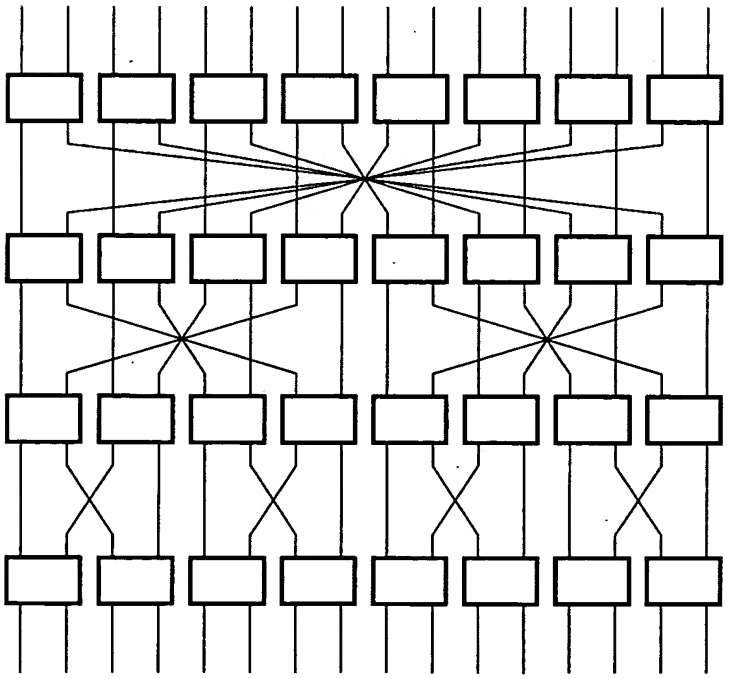

FIG. 1E (Prior Art)

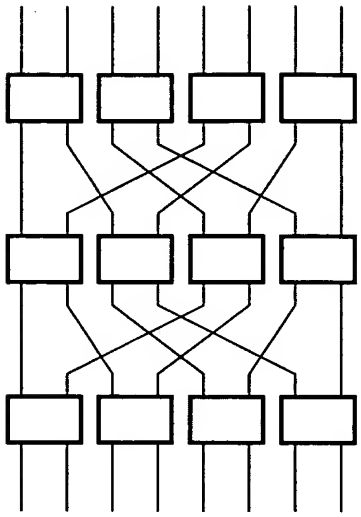

FIG. 1F (Prior Art)

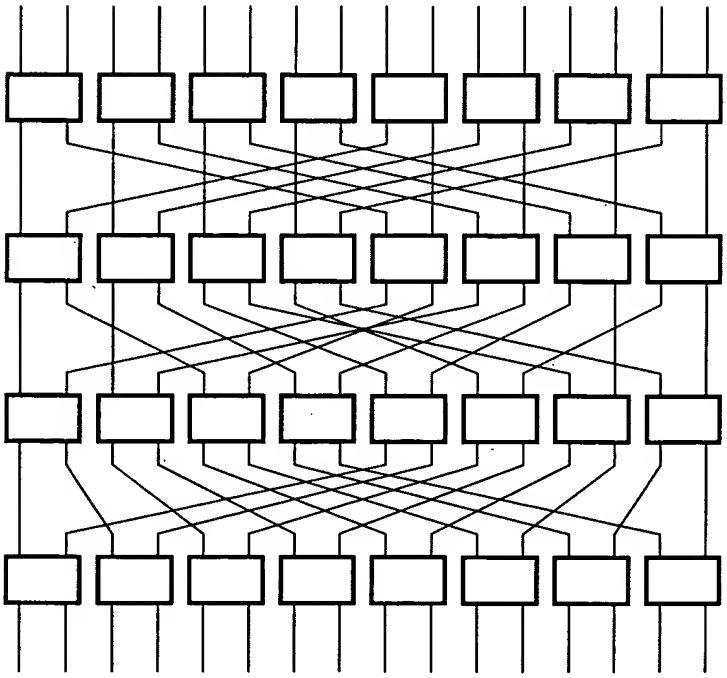

FIG. 1G (Prior Art)

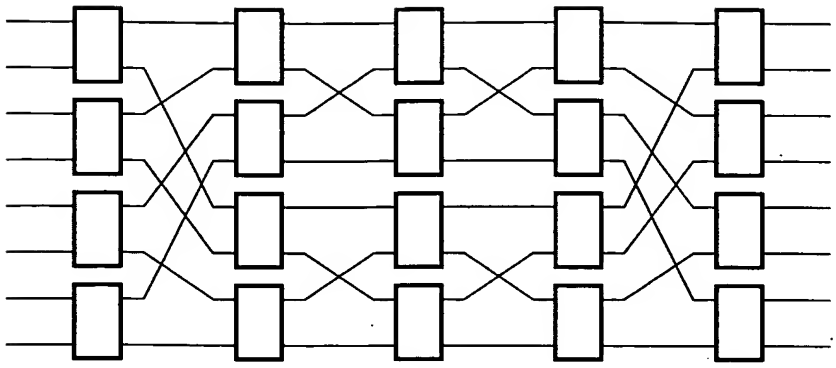

FIG. 2A (Prior Art)

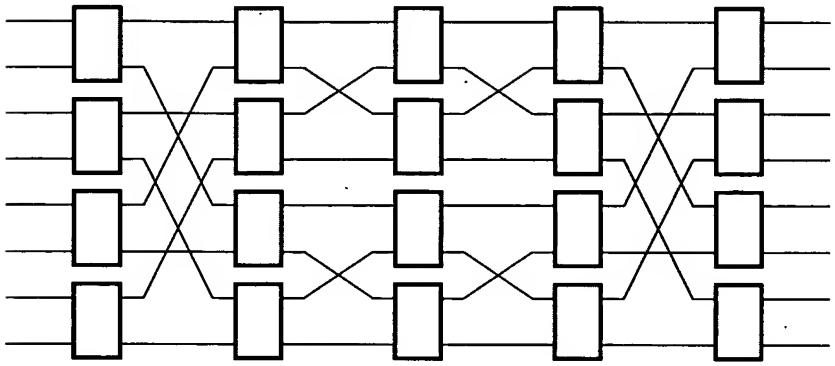

FIG. 2B (Prior Art)

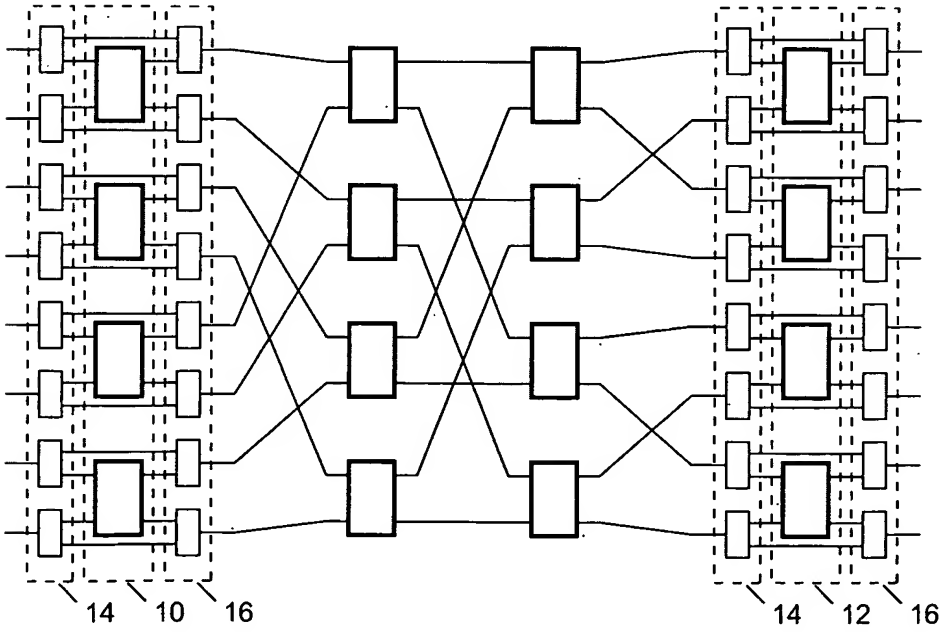

FIG. 2C (Prior Art)

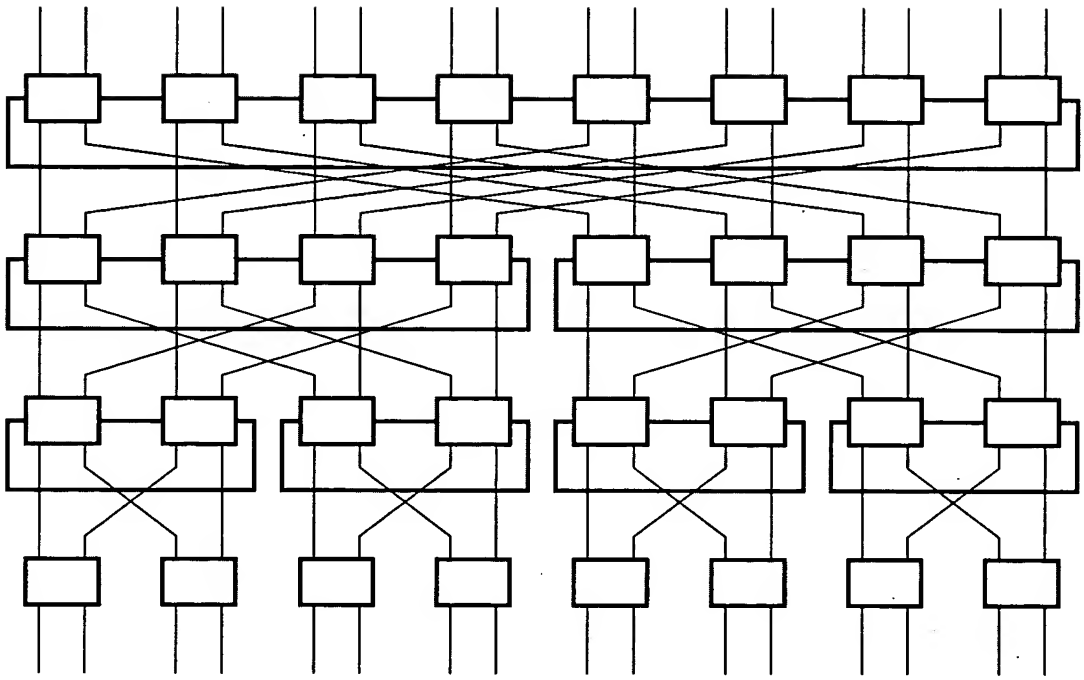

FIG. 2D (Prior Art)

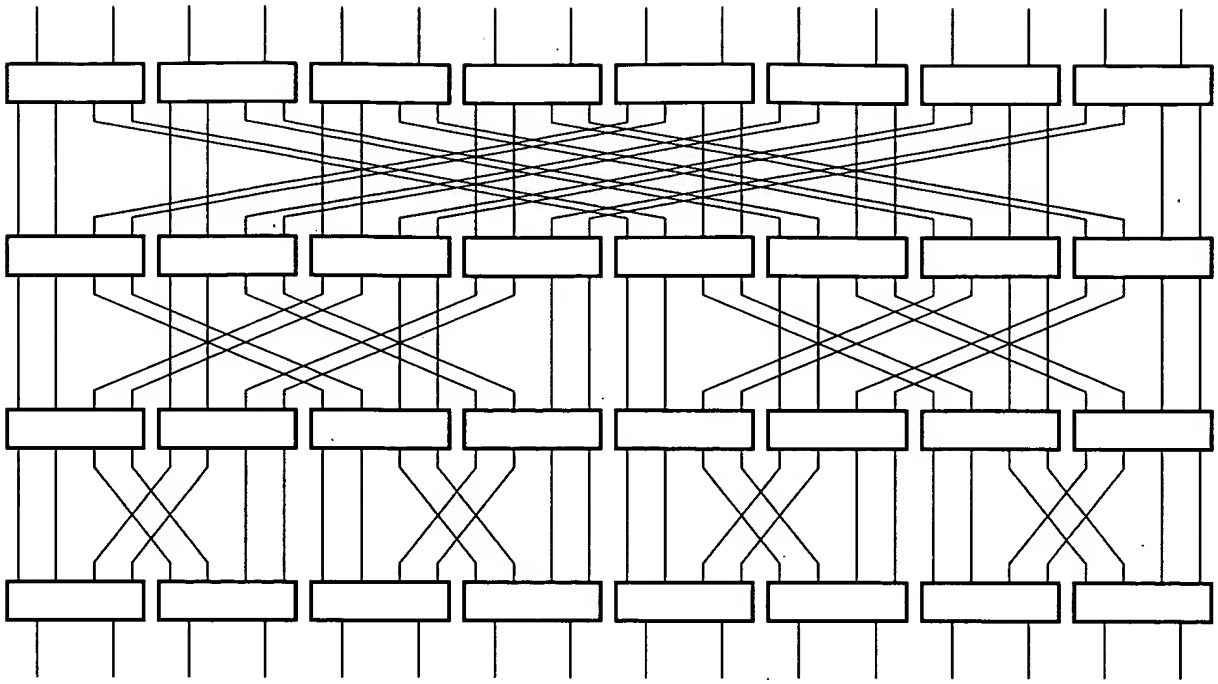

FIG. 3A (Prior Art)

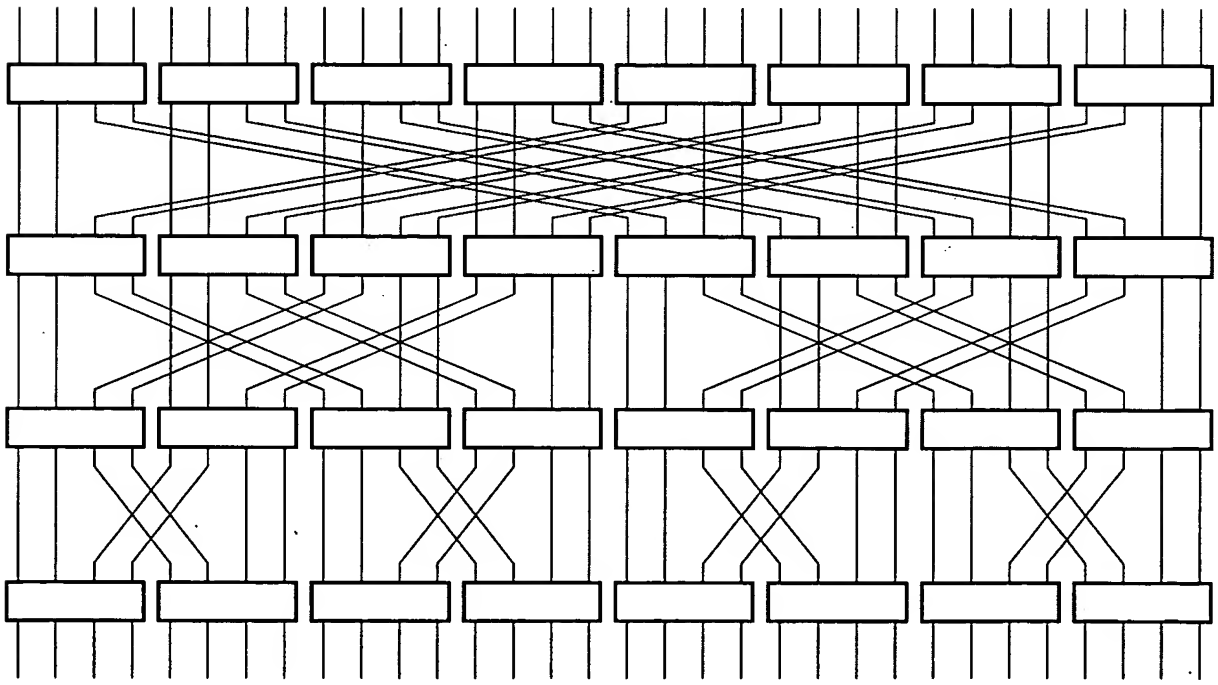

FIG. 3B (Prior Art)

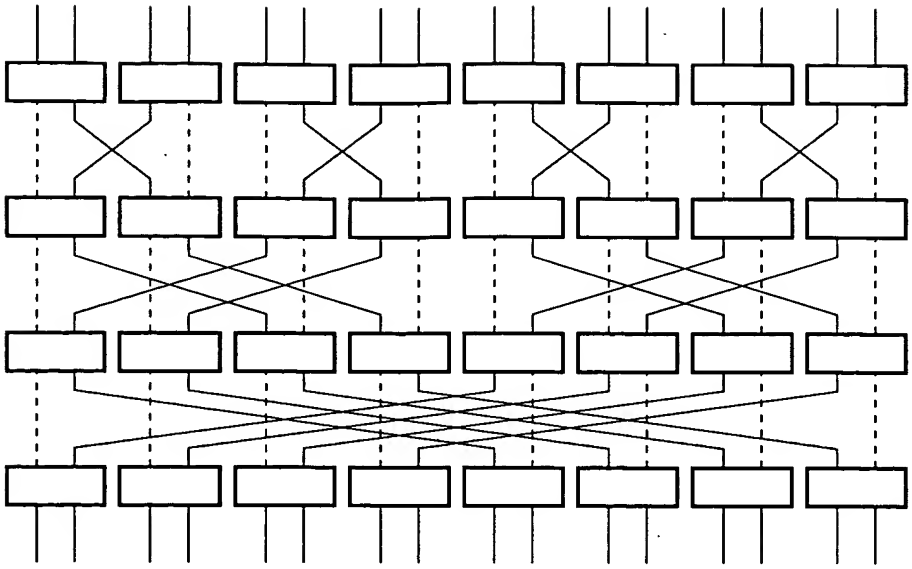

FIG. 4A (Prior Art)

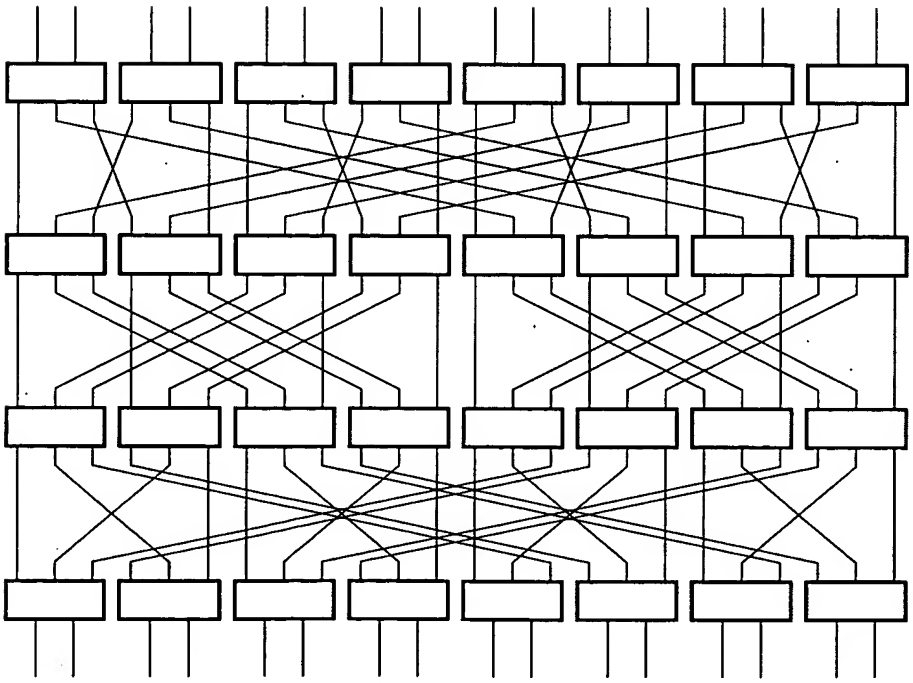

FIG. 4B (Prior Art)

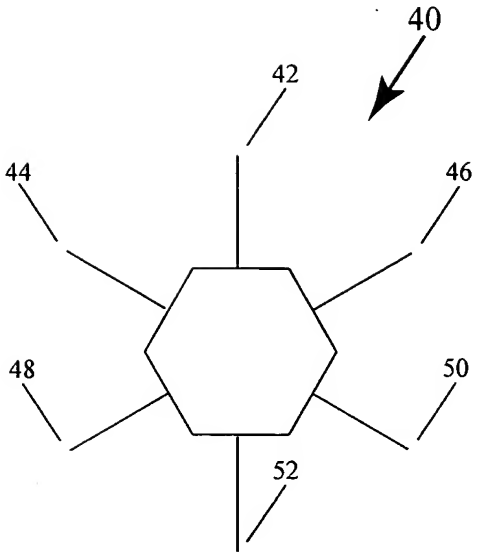

FIG. 5A

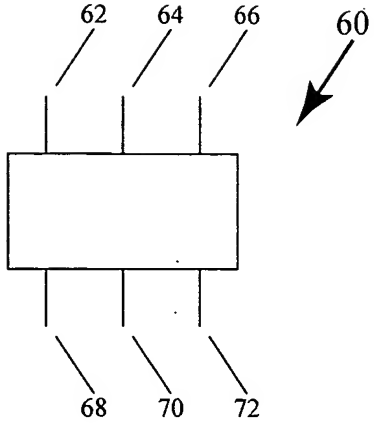

FIG. 5B

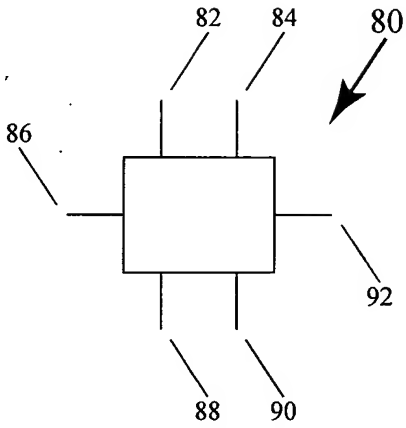

FIG. 5C

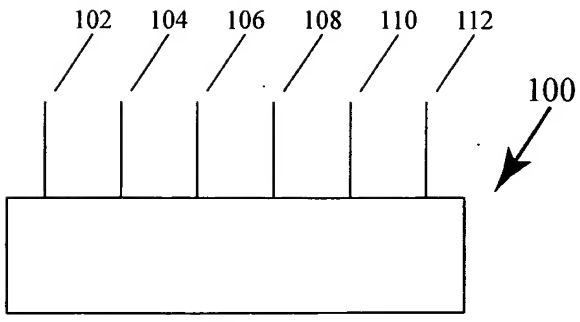

FIG. 5D

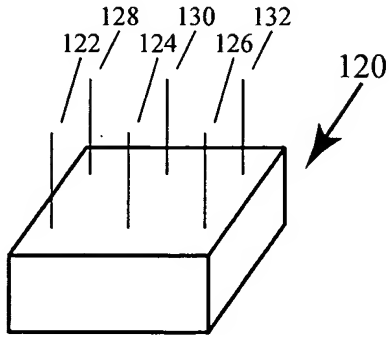

FIG. 5E

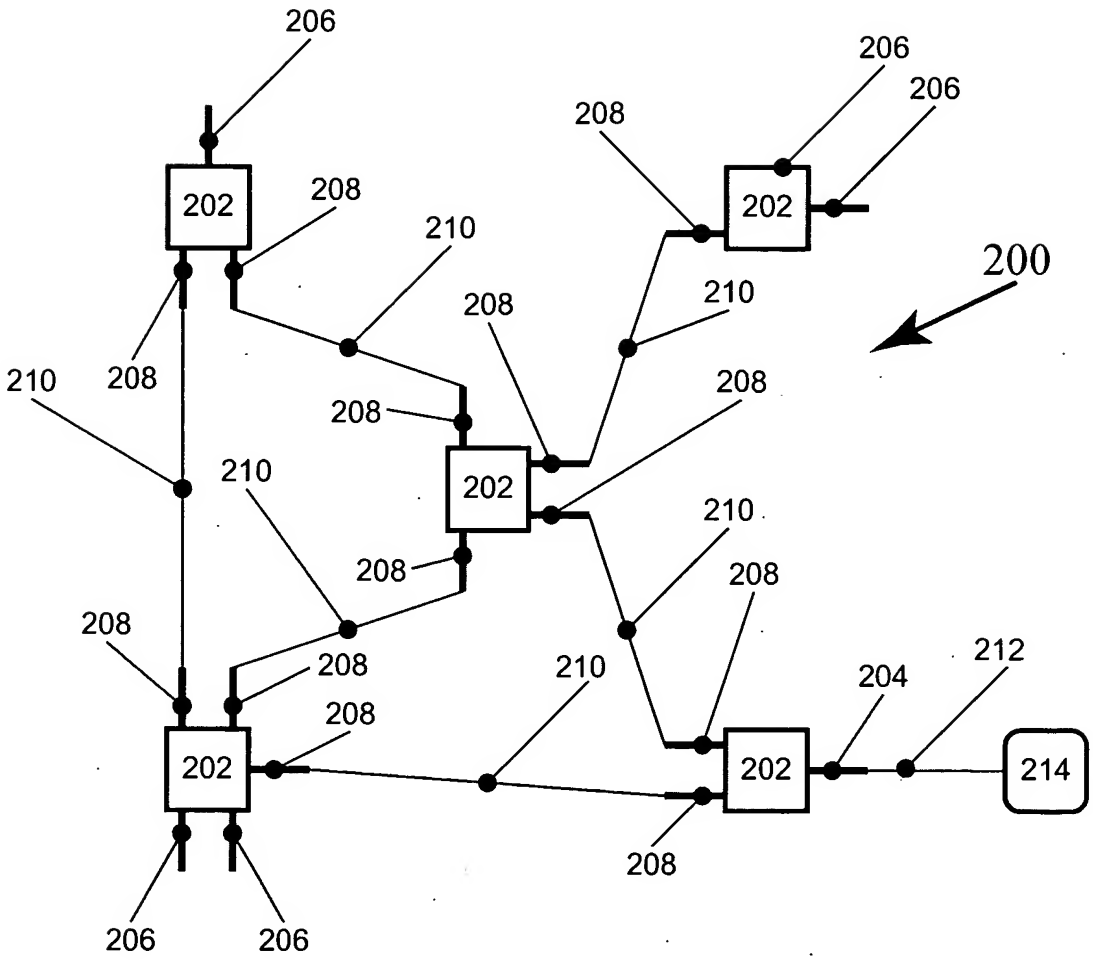
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FIG. 6A

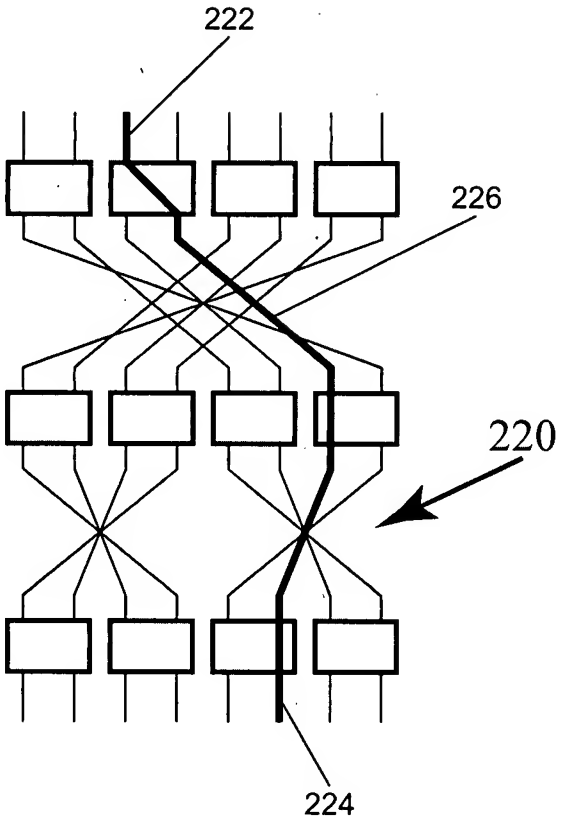


FIG. 6B

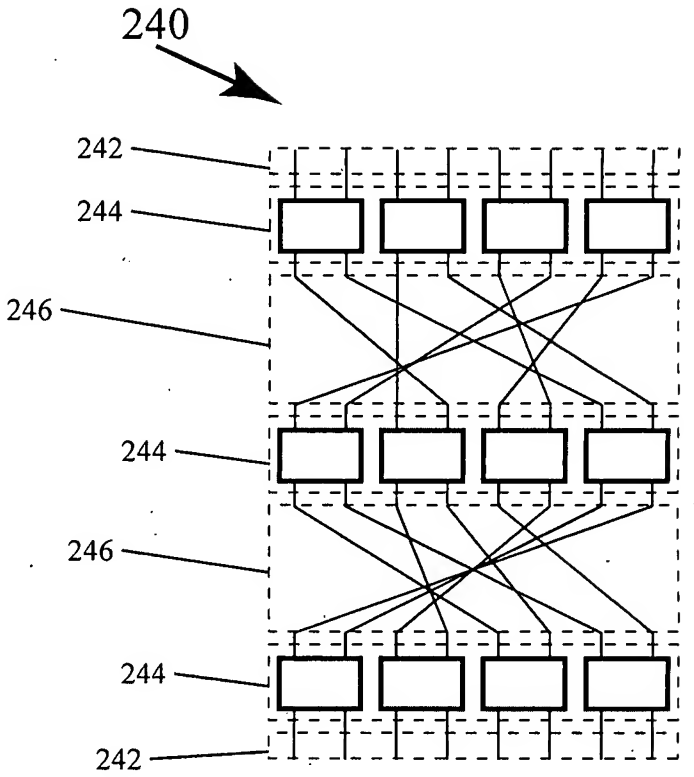


FIG. 6C

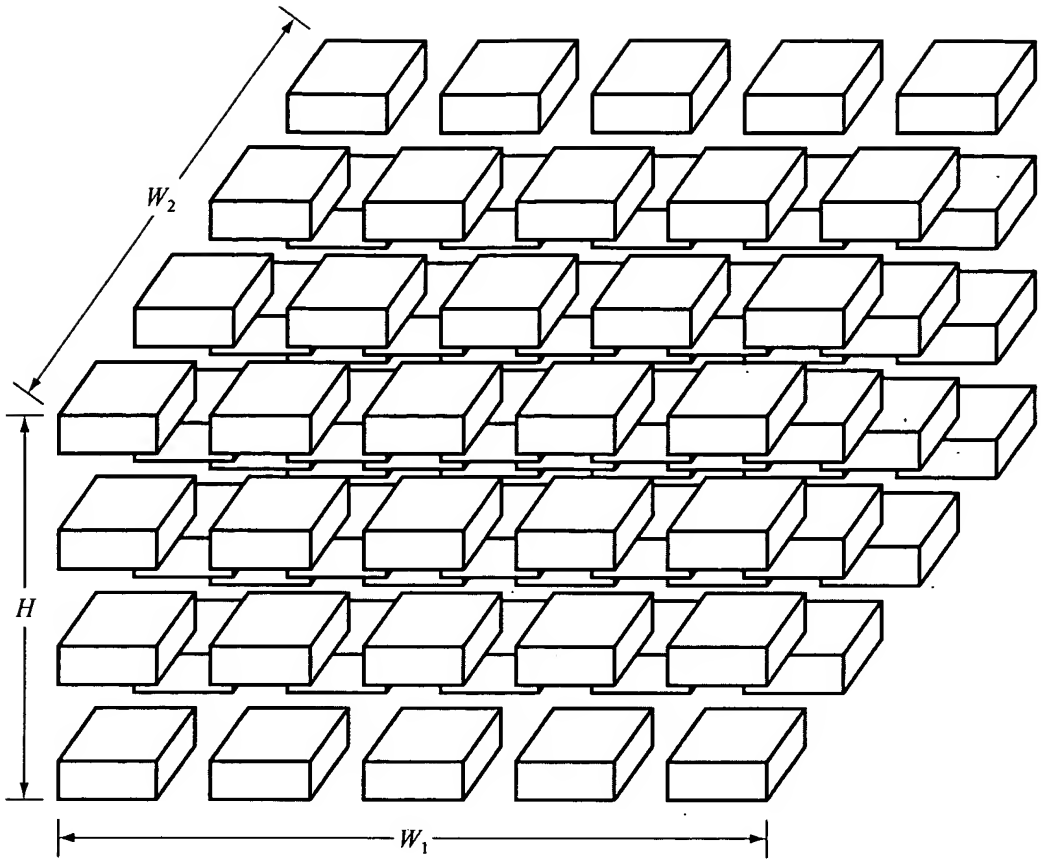
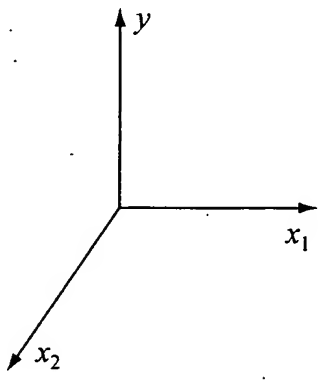


FIG. 7A

FIG. 7B



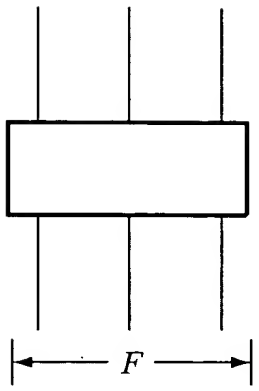


FIG. 7C

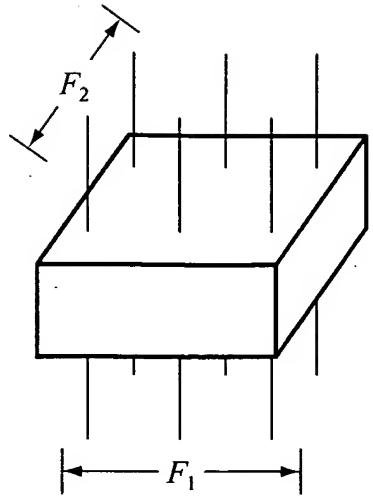


FIG. 7D

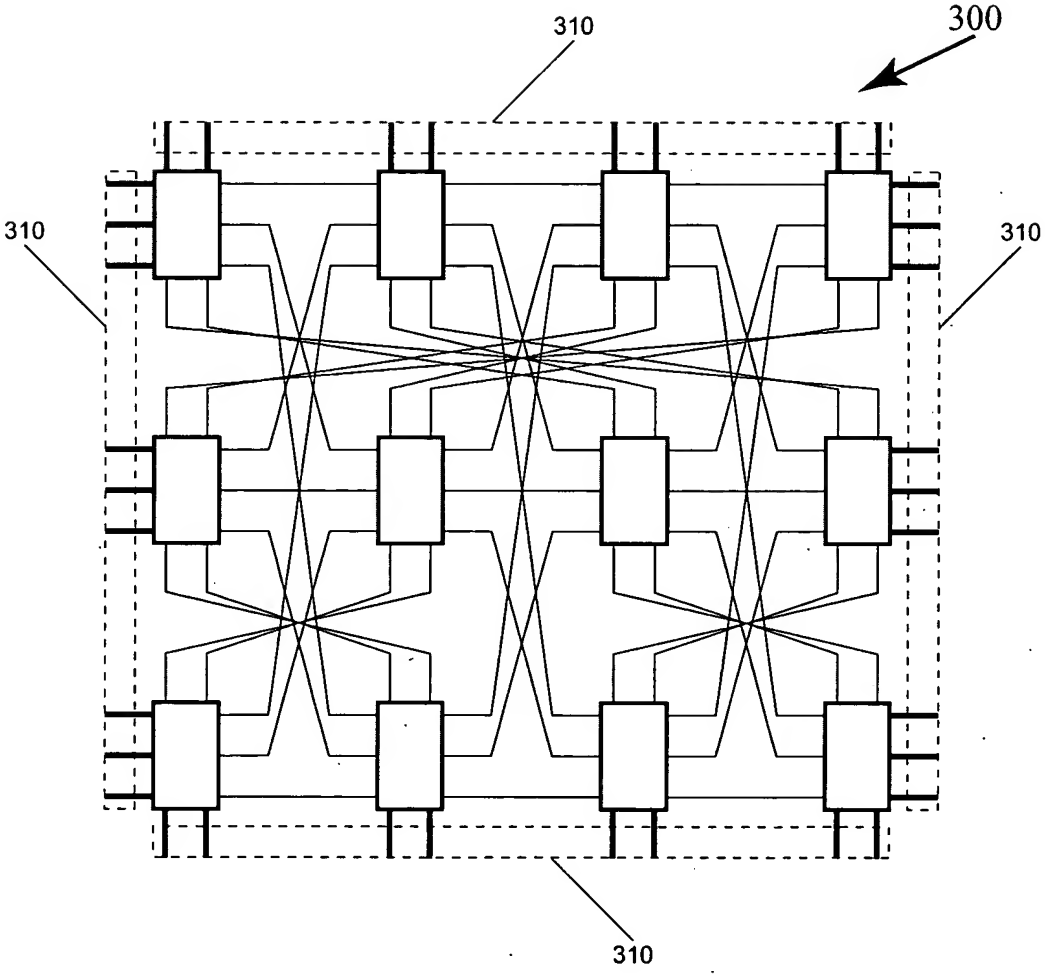


FIG. 8A

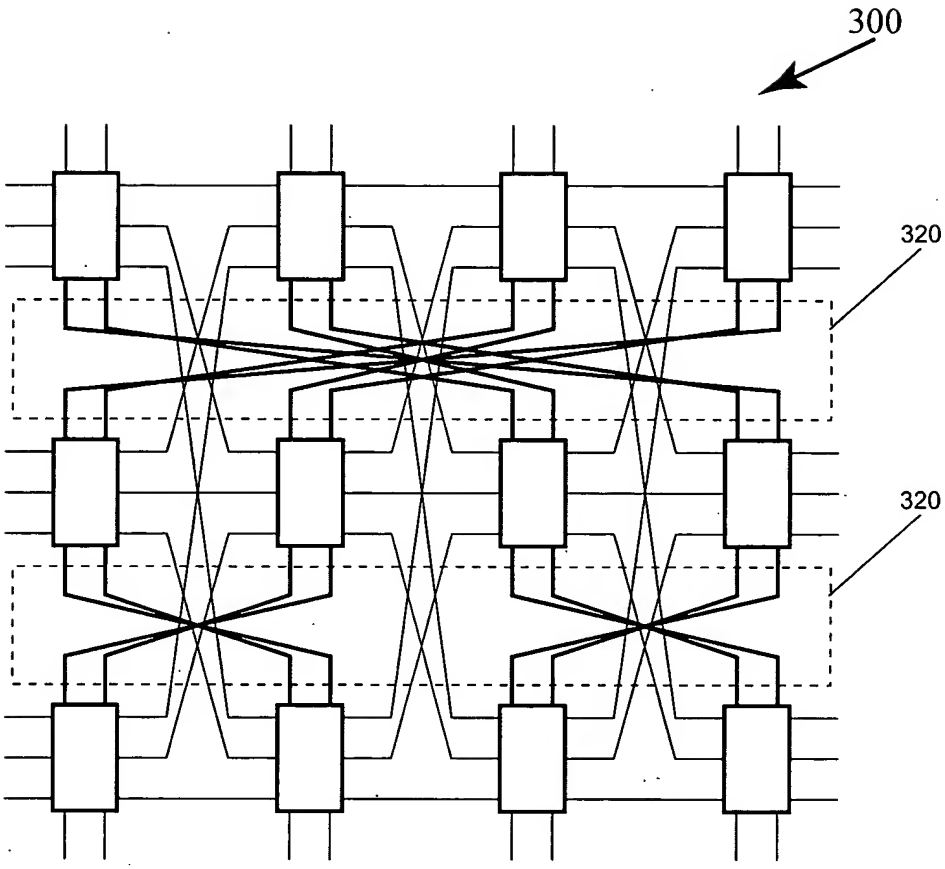


FIG. 8B

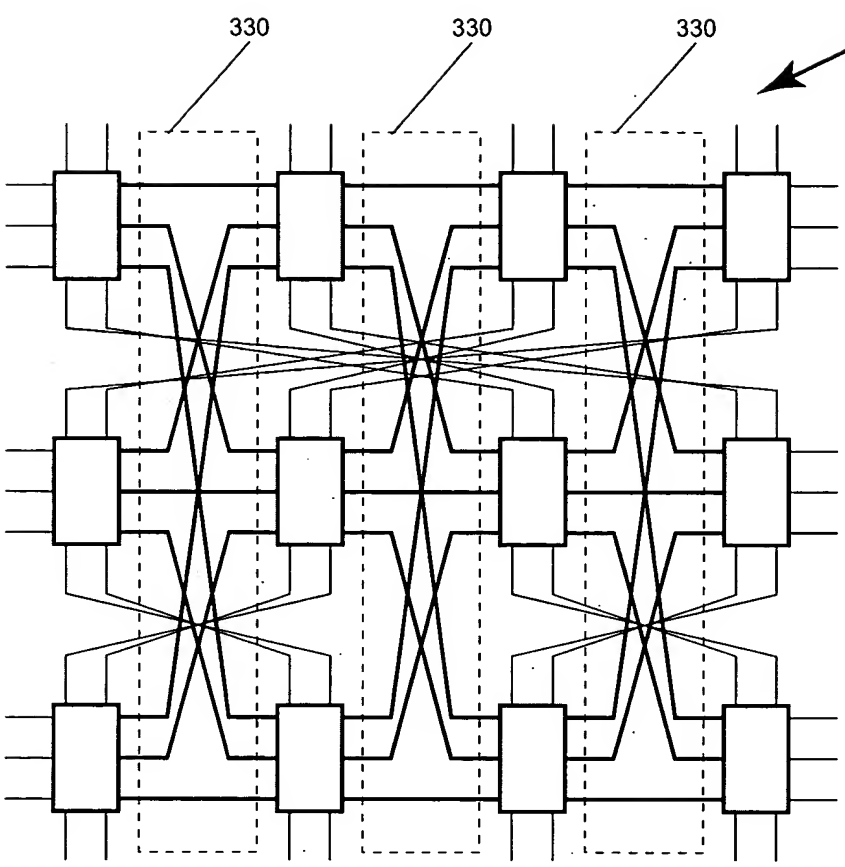

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FIG. 8C

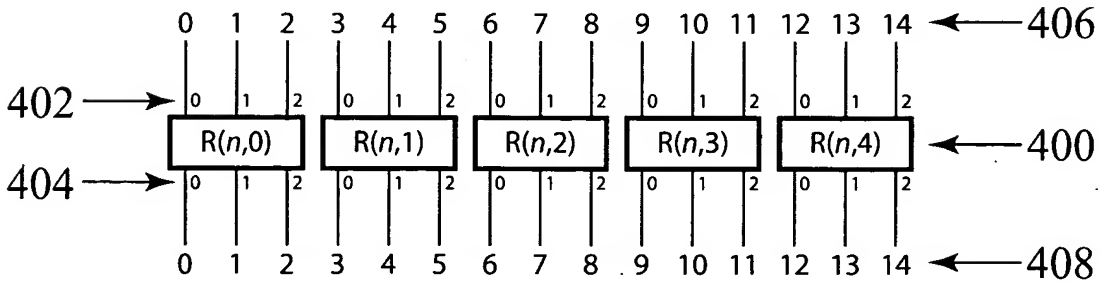

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
406
402
404
R(n,0)
R(n,1)
R(n,2)
R(n,3)
R(n,4)
400
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14
408

FIG. 9

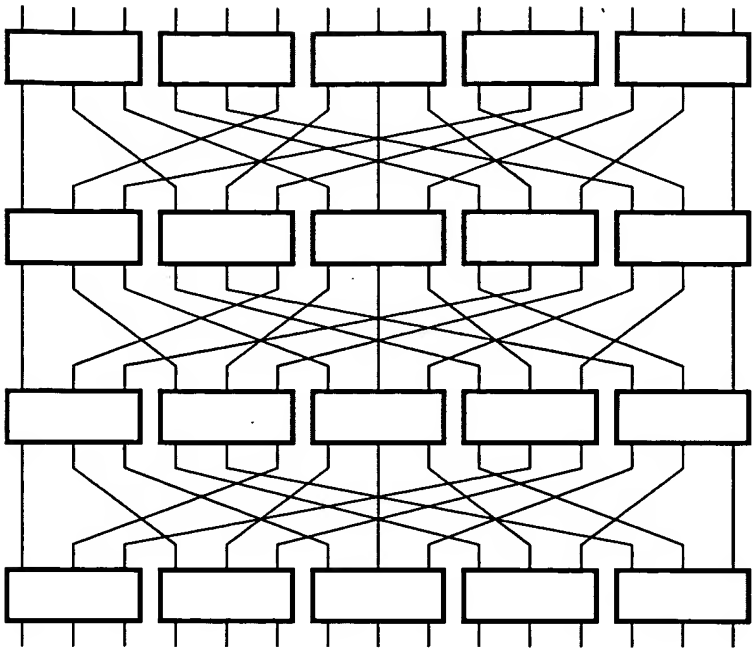


FIG. 10

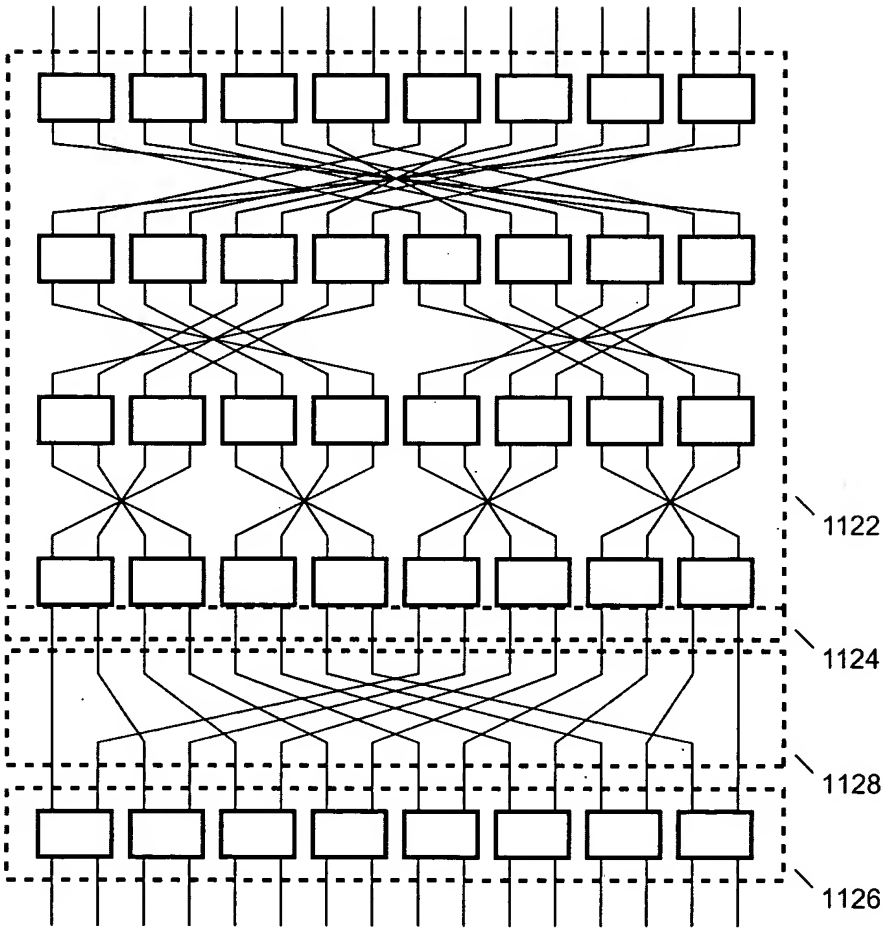


FIG. 11A

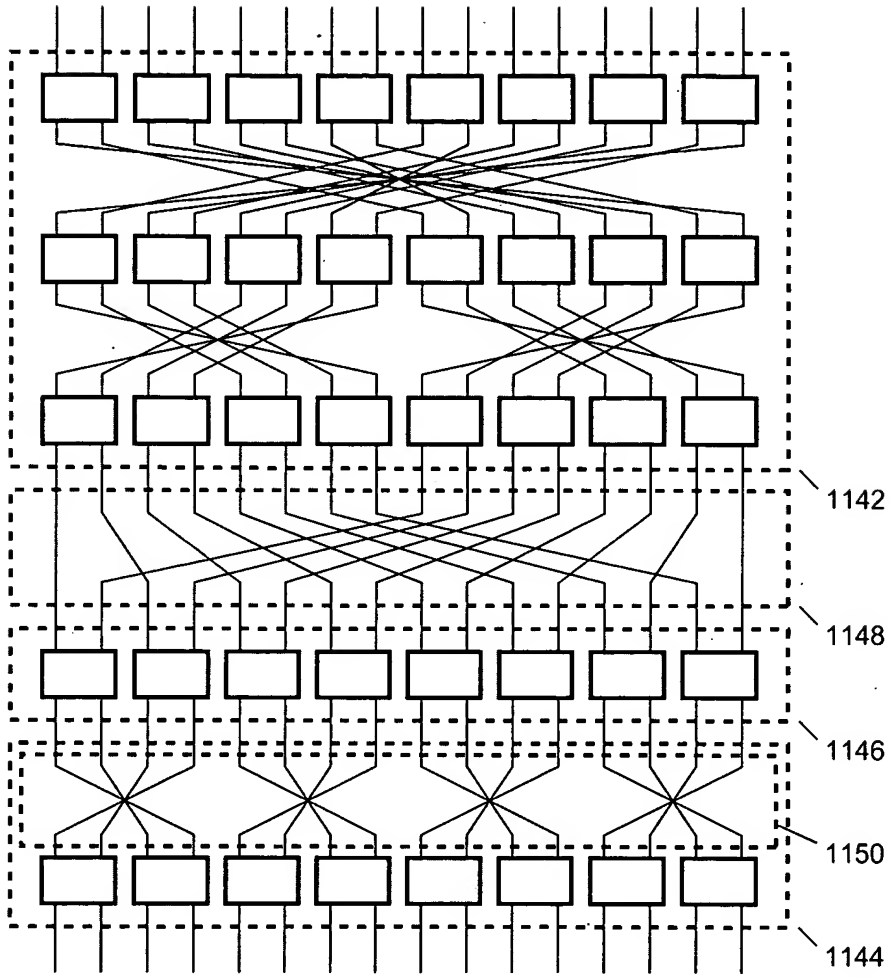


FIG. 11B

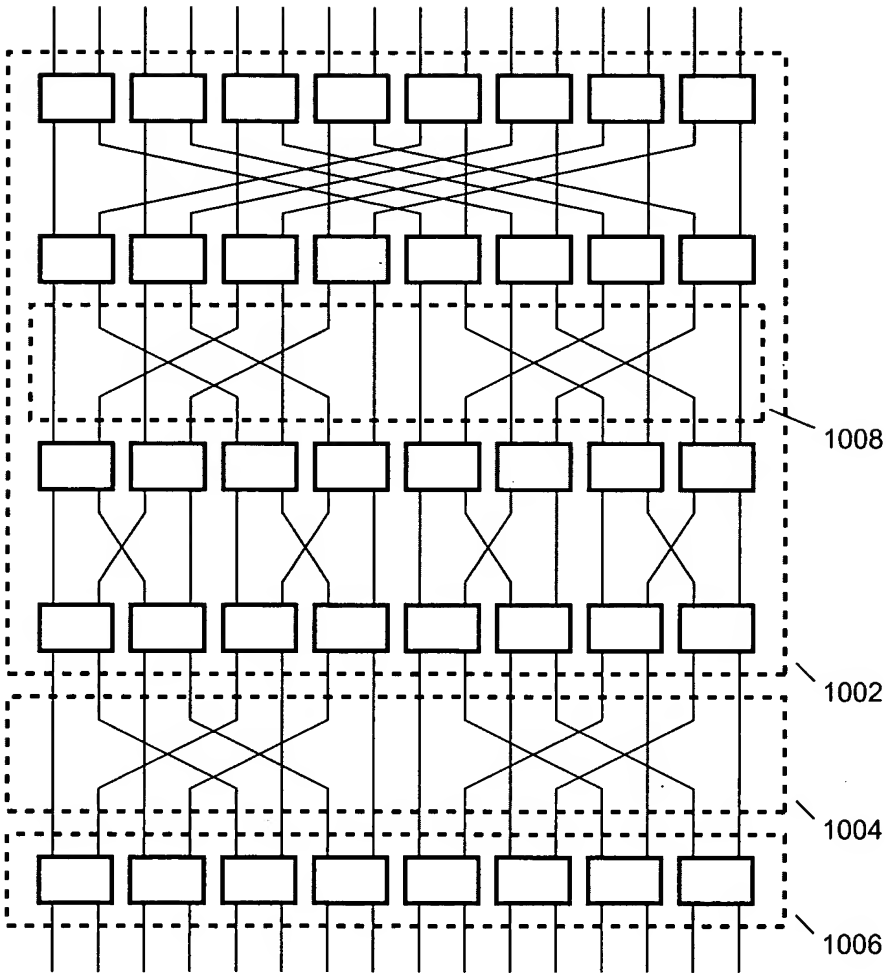


FIG. 12

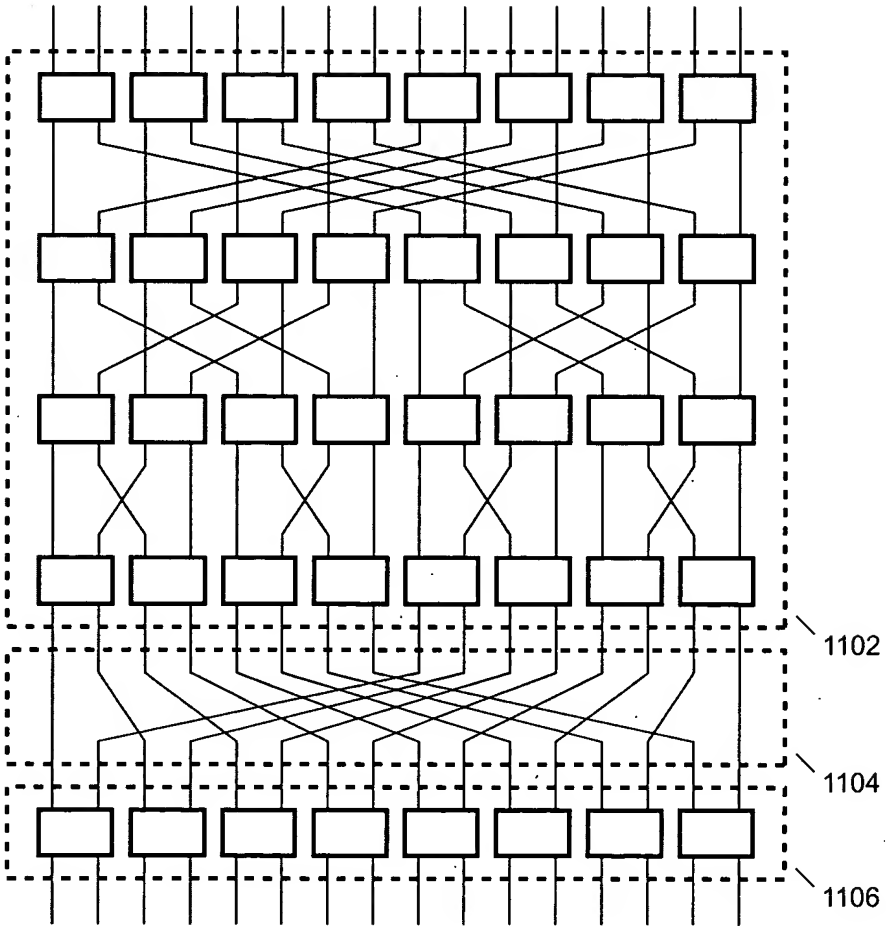


FIG. 13A

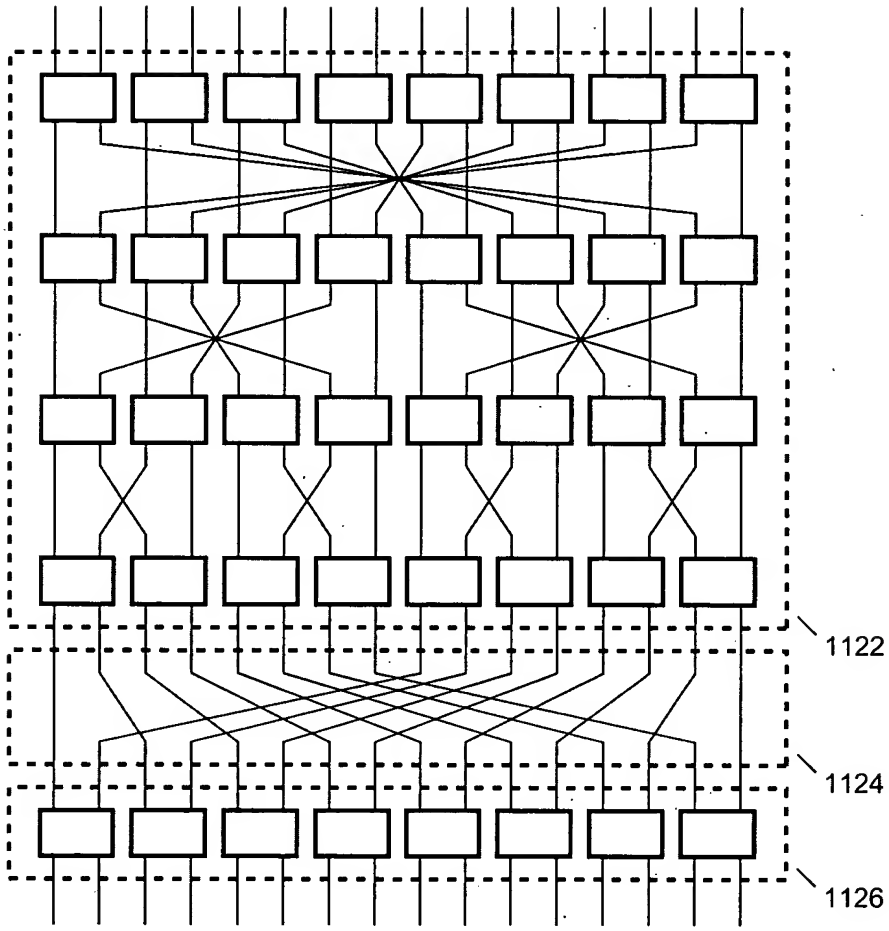


FIG. 13B

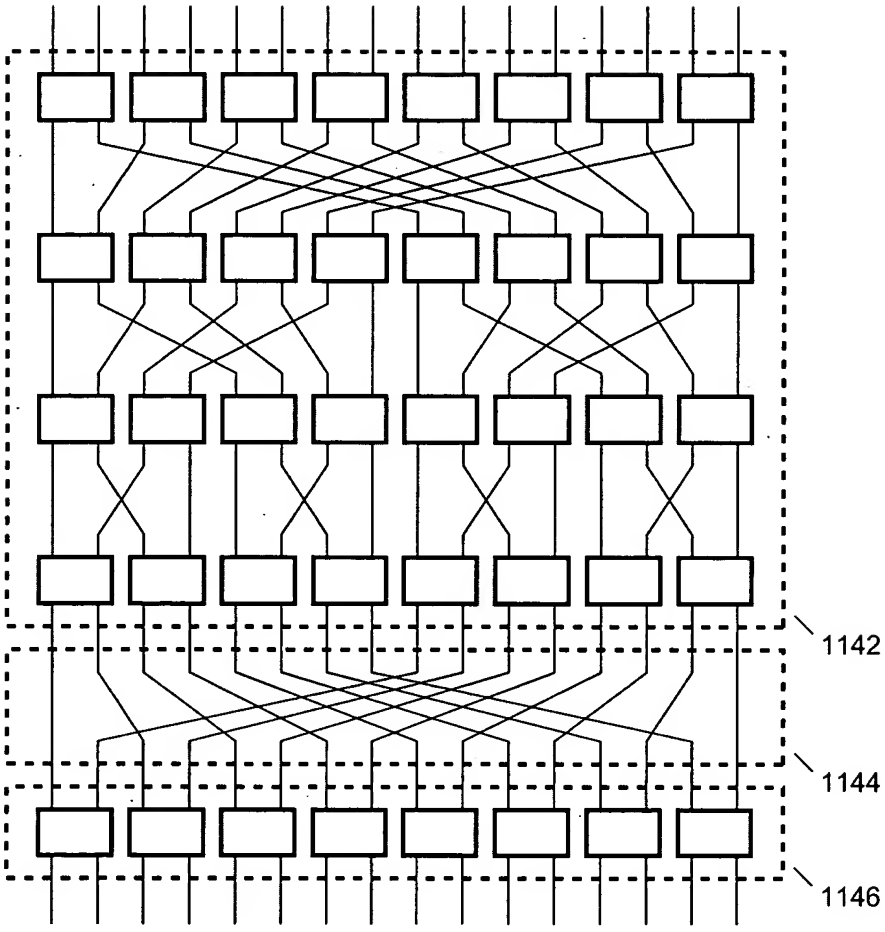


FIG. 13C

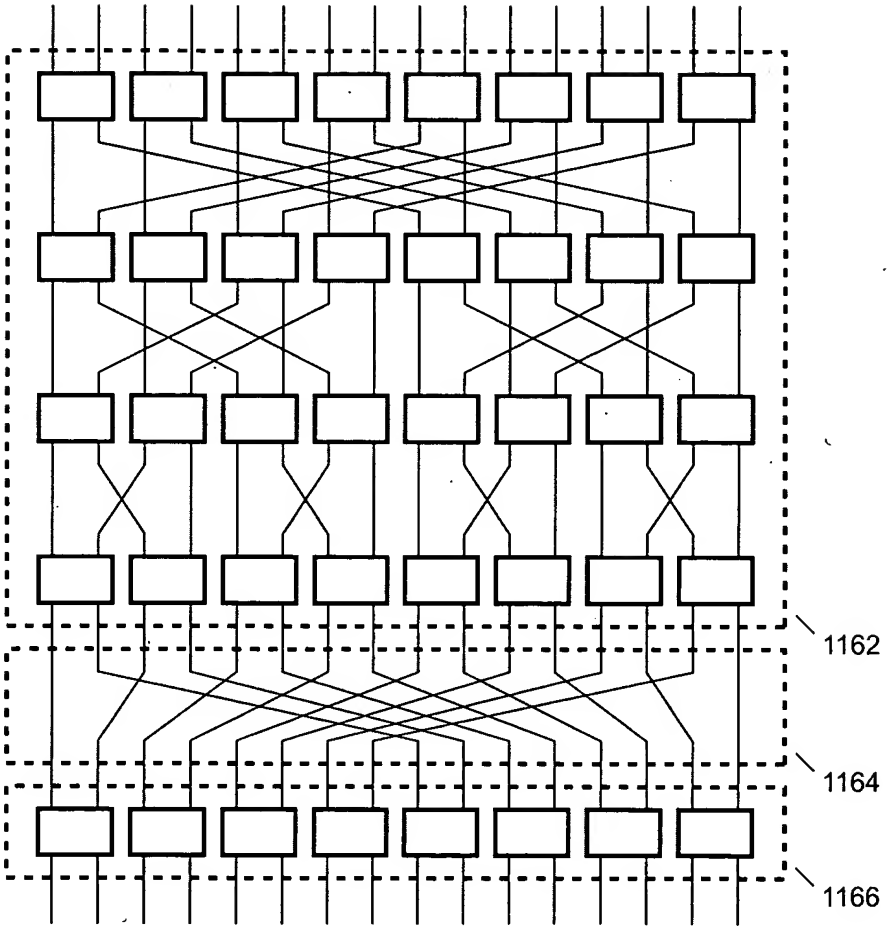


FIG. 13D

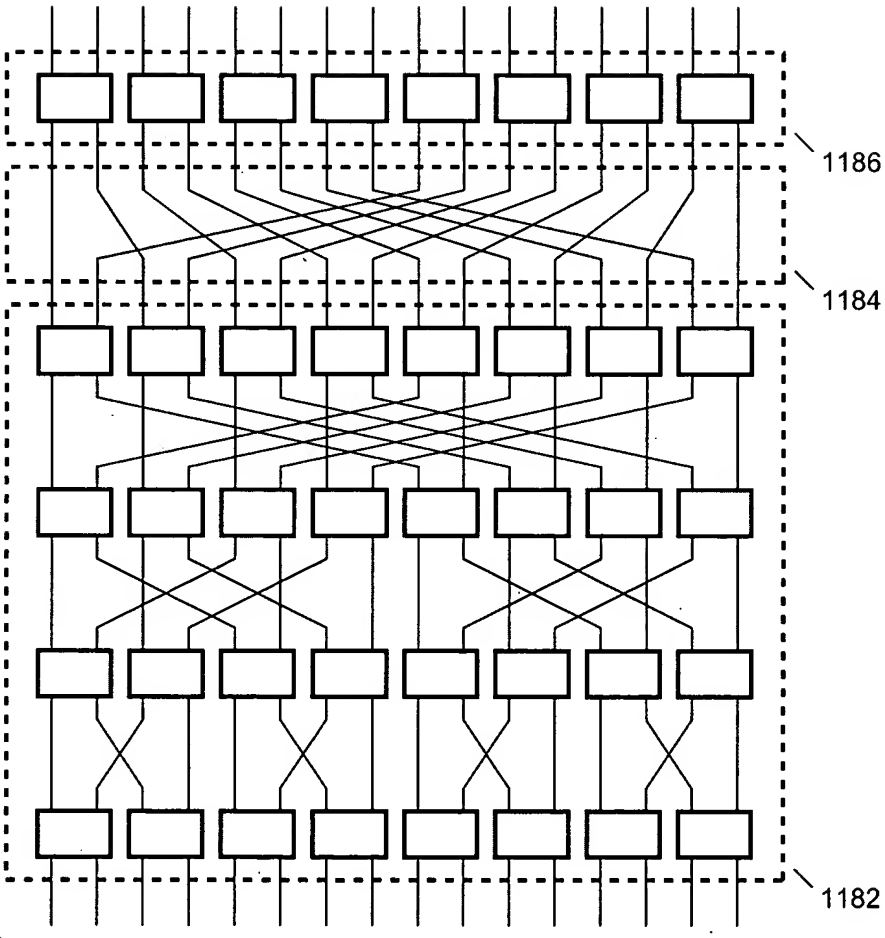


FIG. 13E

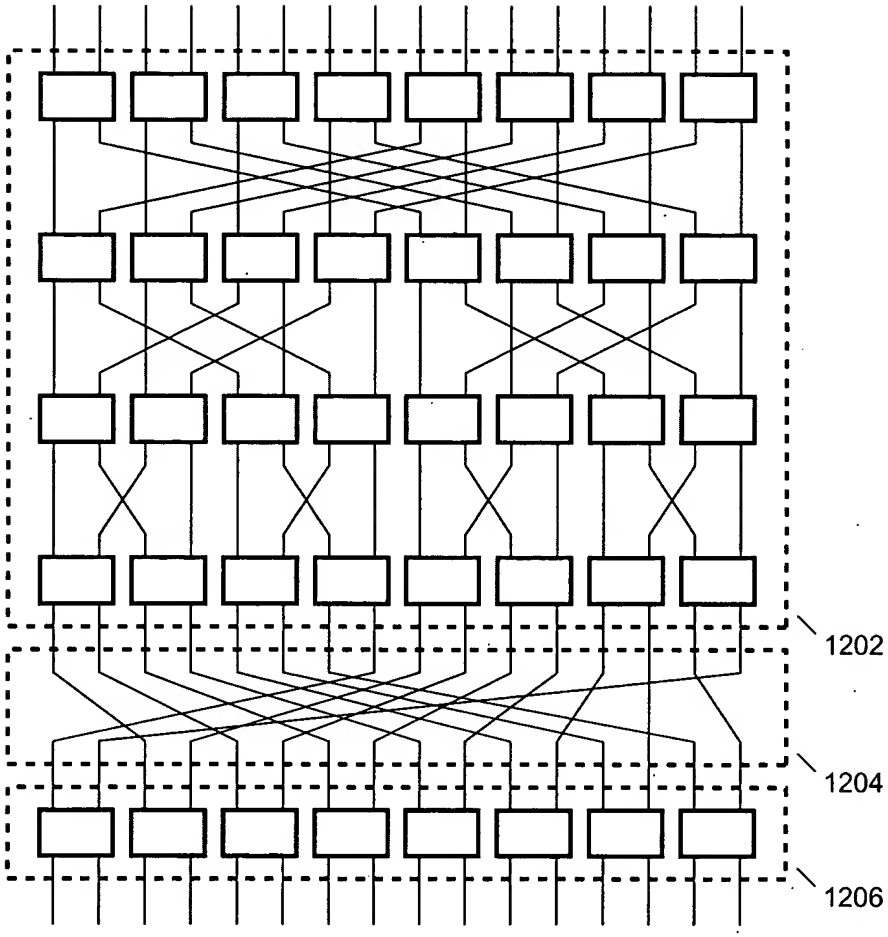


FIG. 13F

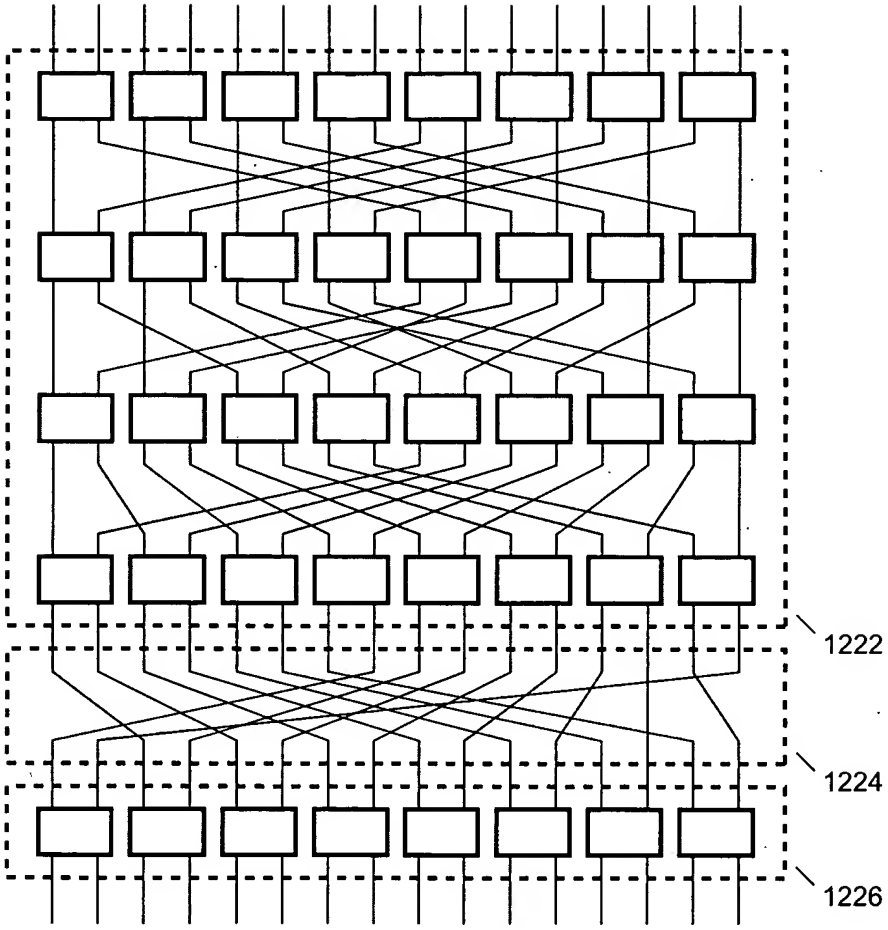


FIG. 13G

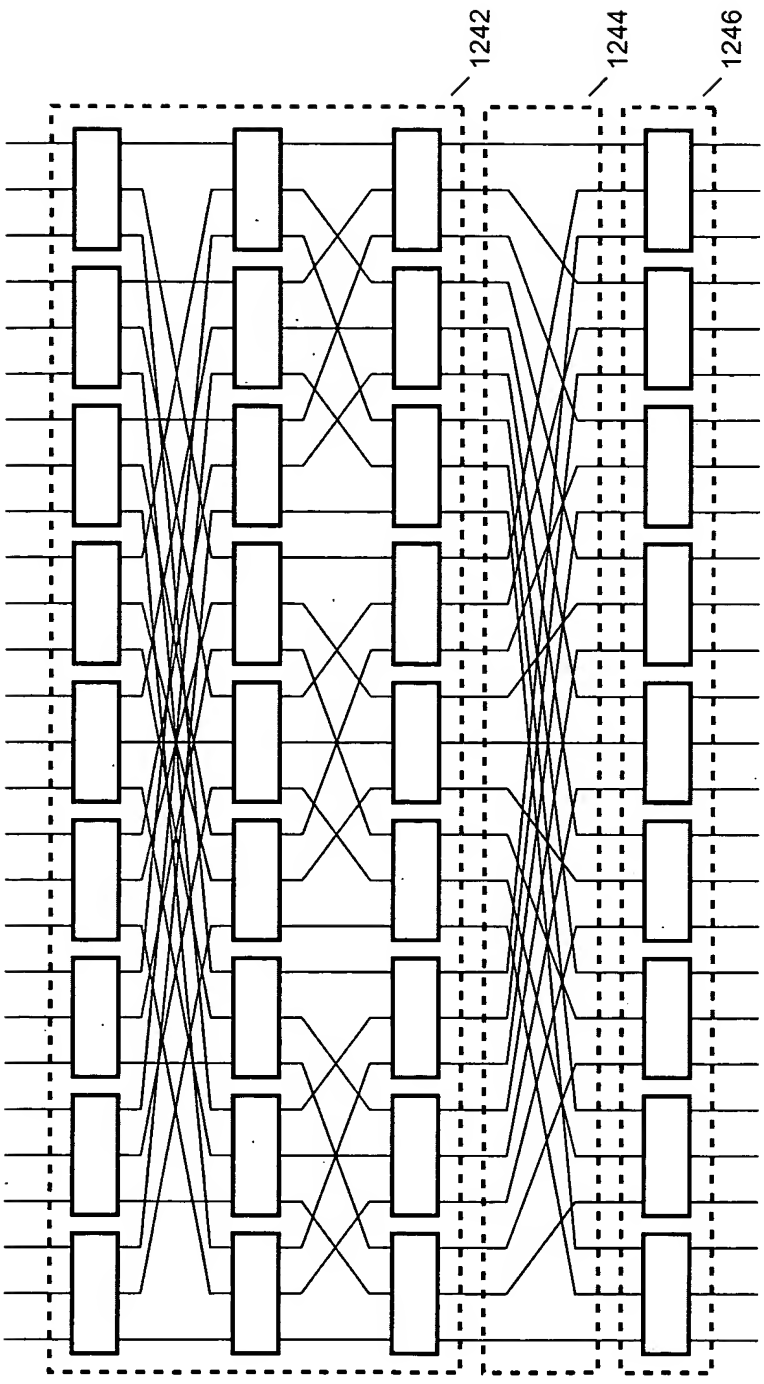


FIG. 13H

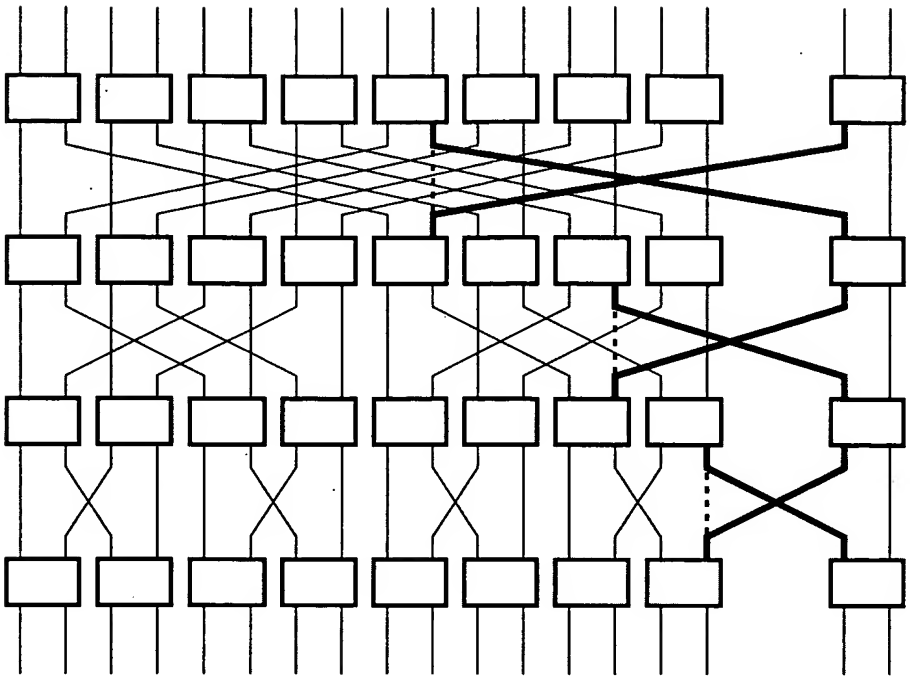


FIG. 14A

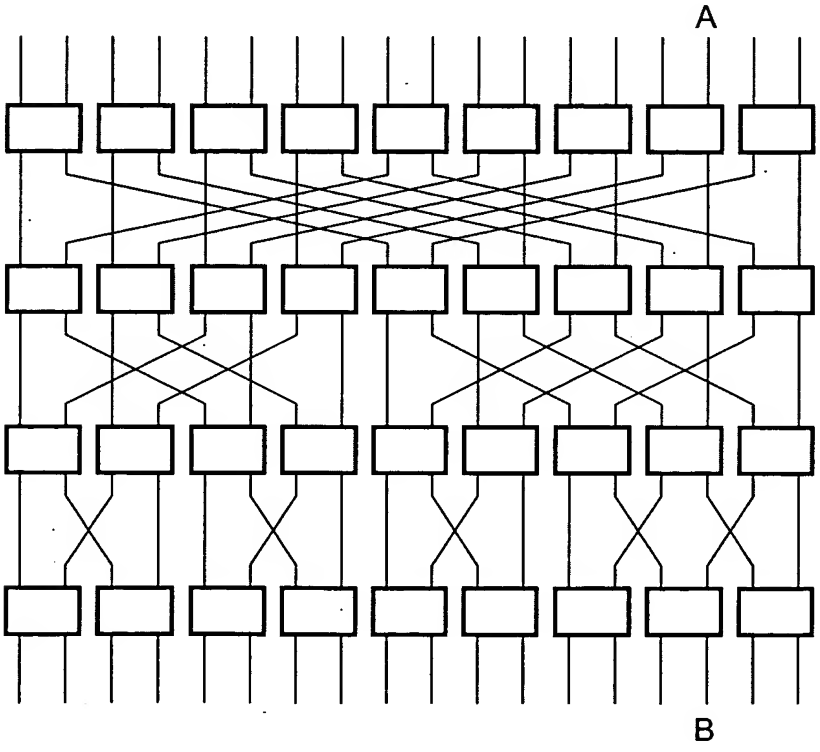


FIG. 14B

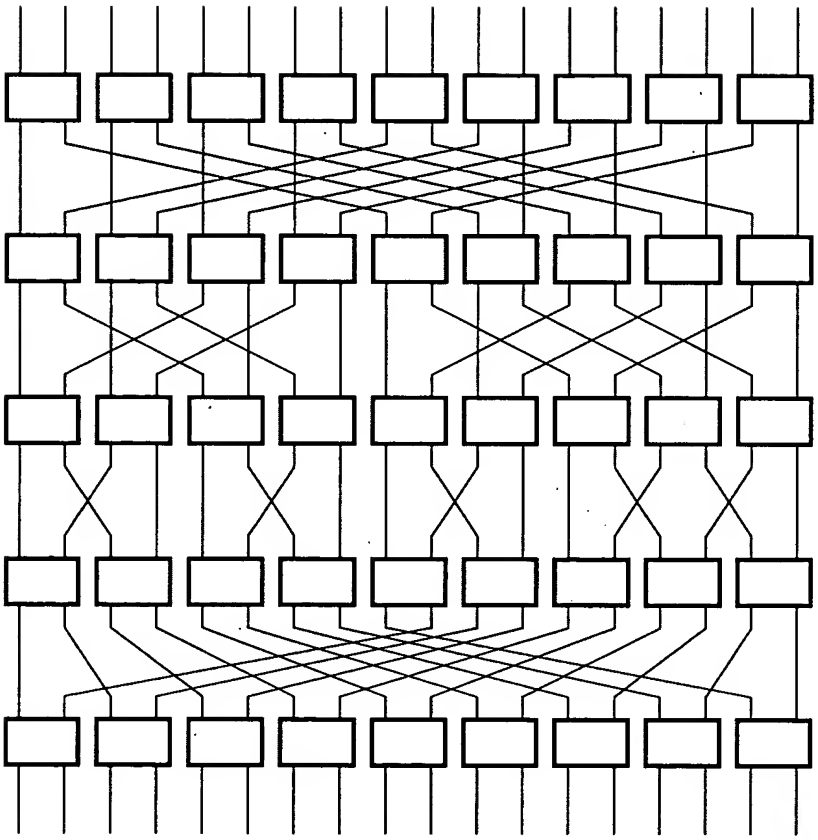


FIG. 14C

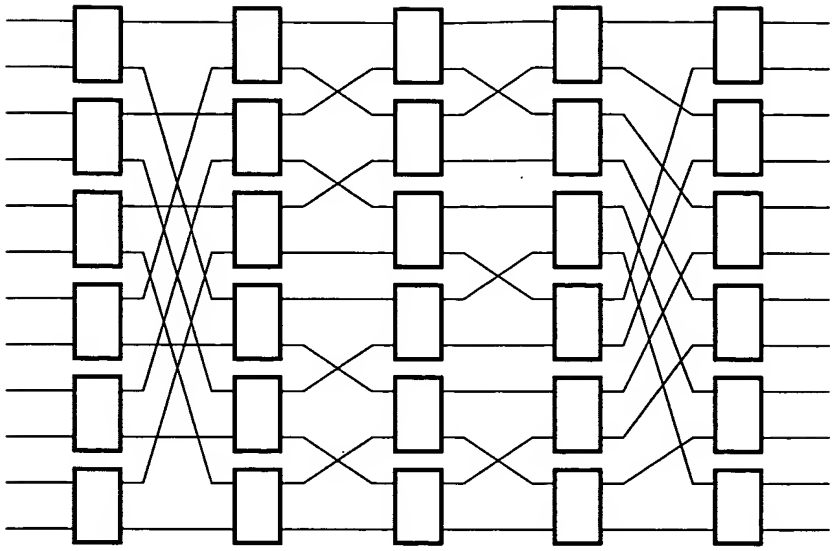


FIG. 14E

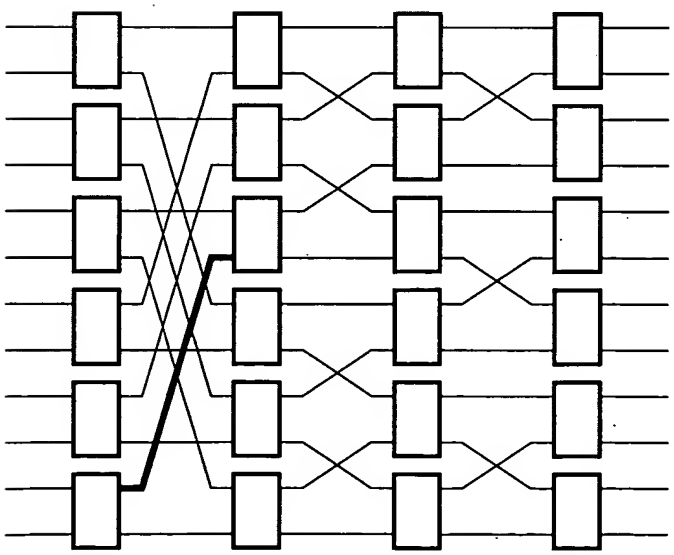


FIG. 14D

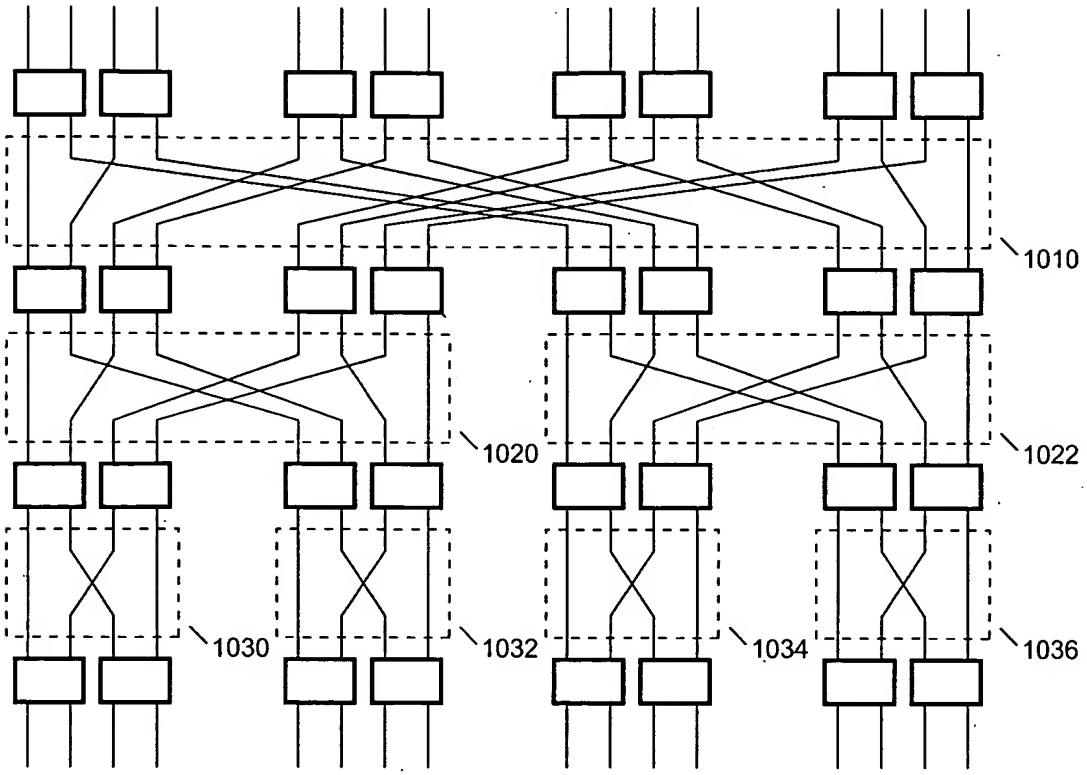


FIG. 15A

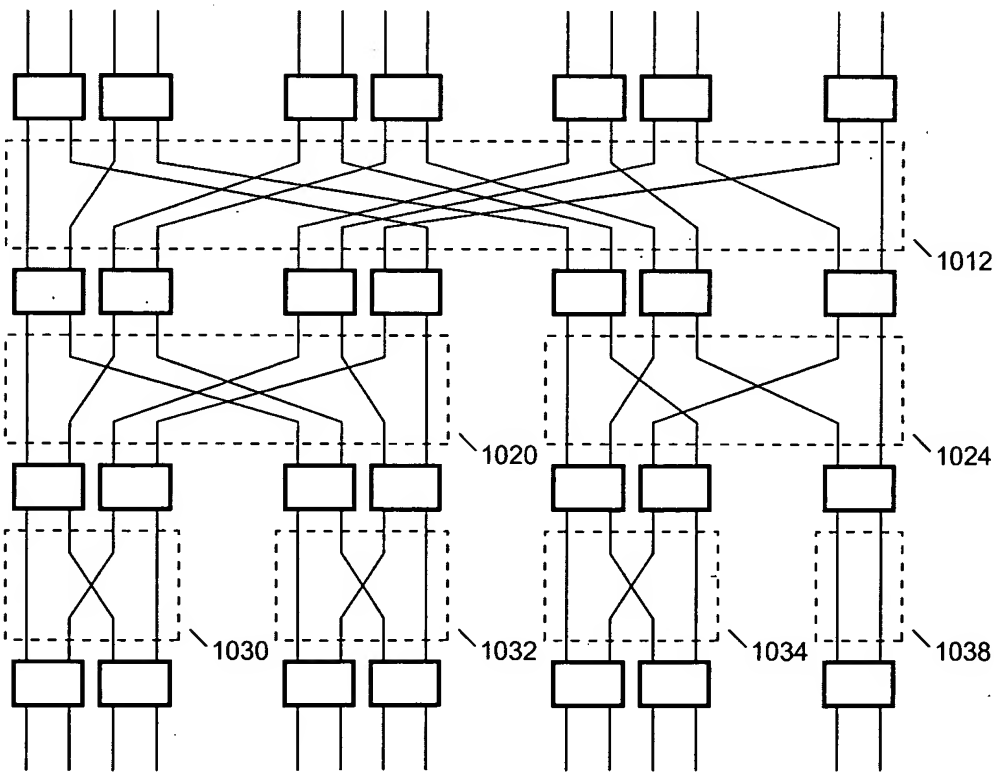


FIG. 15B

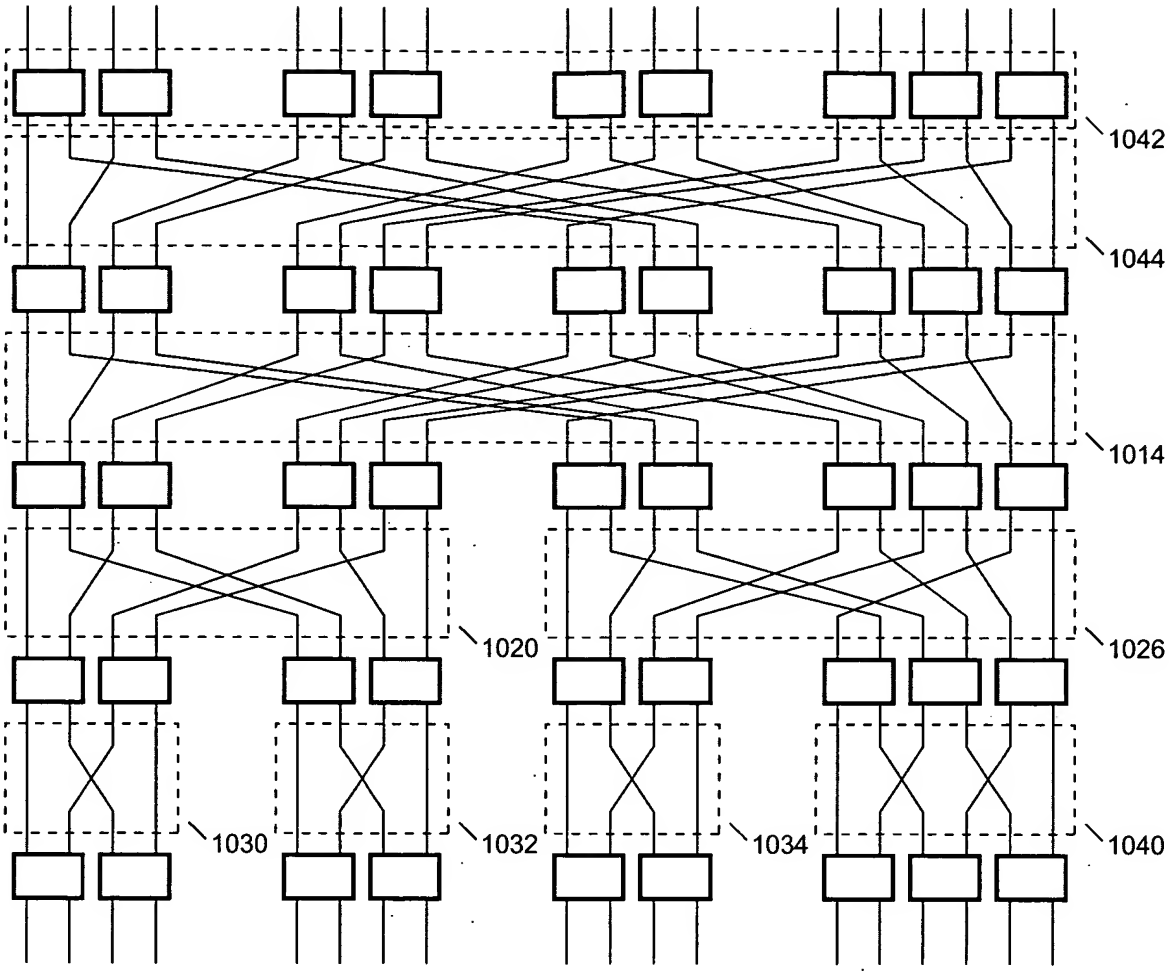


FIG. 15C

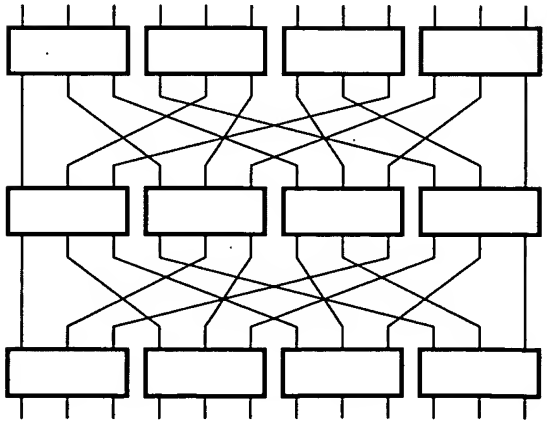


FIG. 16A

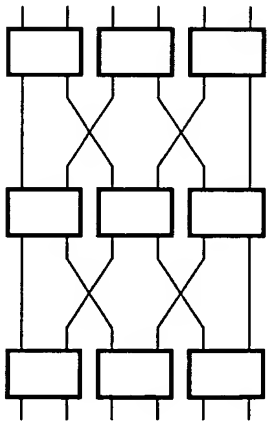


FIG. 16B

0	1	2	3	4	5	6	7	8	9	10	11
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
0	3	6	9	1	4	7	10	2	5	8	11

FIG. 17A

0	1	2	3	4	5
↓	↓	↓	↓	↓	↓
0	2	4	1	3	5

FIG. 17B

(0,0)	(1,0)	(2,0)	(3,0)	(4,0)	(5,0)	(6,0)	(7,0)	(8,0)	(9,0)	(10,0)	(11,0)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,0)	(3,0)	(6,0)	(9,0)	(1,0)	(4,0)	(7,0)	(10,0)	(2,0)	(5,0)	(8,0)	(11,0)

(0,1)	(1,1)	(2,1)	(3,1)	(4,1)	(5,1)	(6,1)	(7,1)	(8,1)	(9,1)	(10,1)	(11,1)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,2)	(3,2)	(6,2)	(9,2)	(1,2)	(4,2)	(7,2)	(10,2)	(2,2)	(5,2)	(8,2)	(11,2)

(0,2)	(1,2)	(2,2)	(3,2)	(4,2)	(5,2)	(6,2)	(7,2)	(8,2)	(9,2)	(10,2)	(11,2)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,4)	(3,4)	(6,4)	(9,4)	(1,4)	(4,4)	(7,4)	(10,4)	(2,4)	(5,4)	(8,4)	(11,4)

(0,3)	(1,3)	(2,3)	(3,3)	(4,3)	(5,3)	(6,3)	(7,3)	(8,3)	(9,3)	(10,3)	(11,3)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,1)	(3,1)	(6,1)	(9,1)	(1,1)	(4,1)	(7,1)	(10,1)	(2,1)	(5,1)	(8,1)	(11,1)

(0,4)	(1,4)	(2,4)	(3,4)	(4,4)	(5,4)	(6,4)	(7,4)	(8,4)	(9,4)	(10,4)	(11,4)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,3)	(3,3)	(6,3)	(9,3)	(1,3)	(4,3)	(7,3)	(10,3)	(2,3)	(5,3)	(8,3)	(11,3)

(0,5)	(1,5)	(2,5)	(3,5)	(4,5)	(5,5)	(6,5)	(7,5)	(8,5)	(9,5)	(10,5)	(11,5)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,5)	(3,5)	(6,5)	(9,5)	(1,5)	(4,5)	(7,5)	(10,5)	(2,5)	(5,5)	(8,5)	(11,5)

FIG. 17C

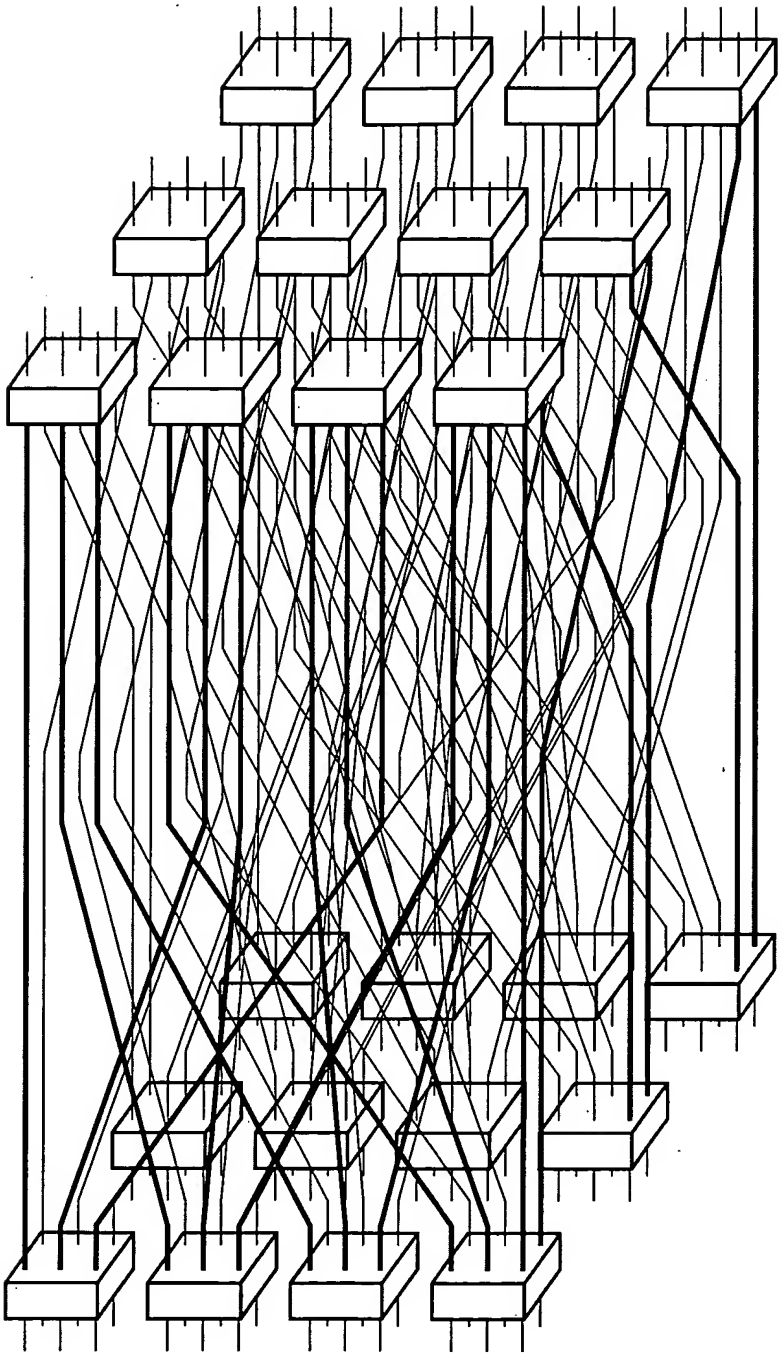


FIG. 18A

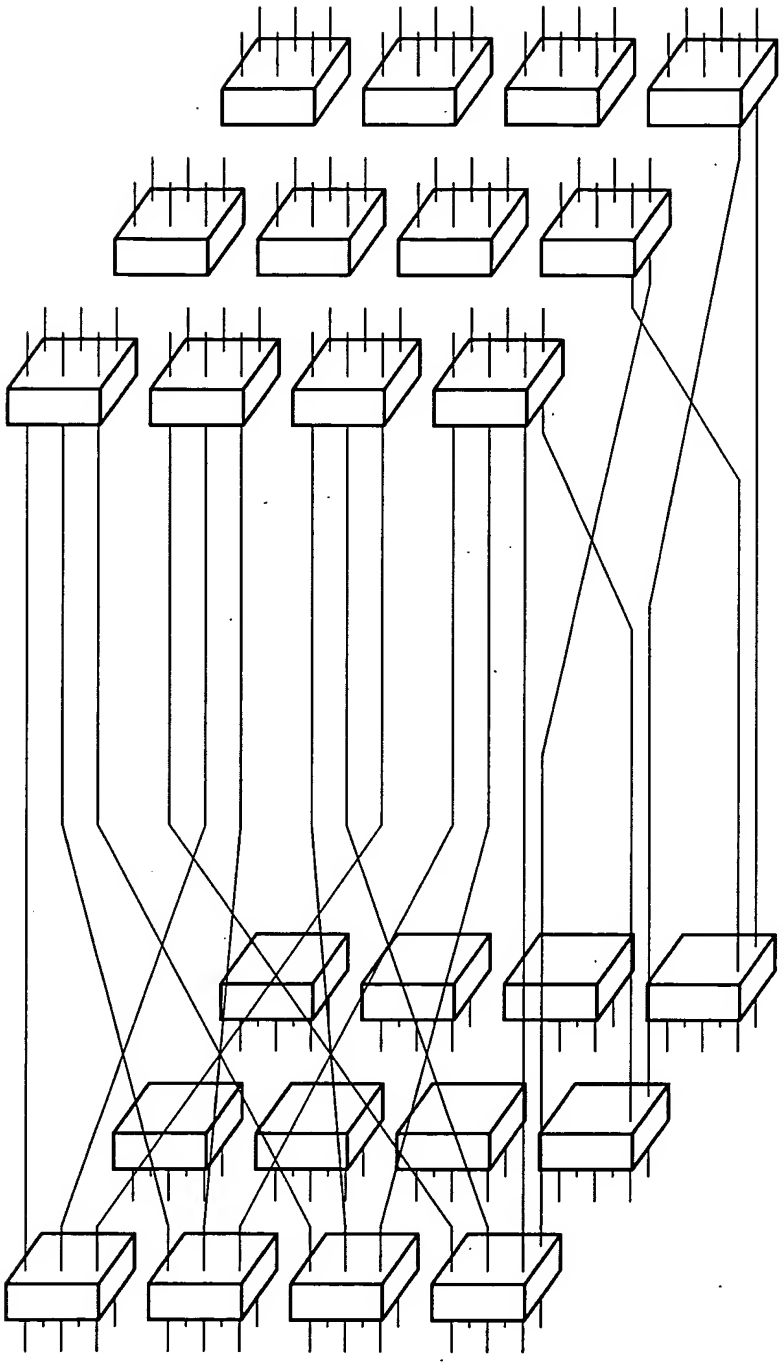


FIG. 18B

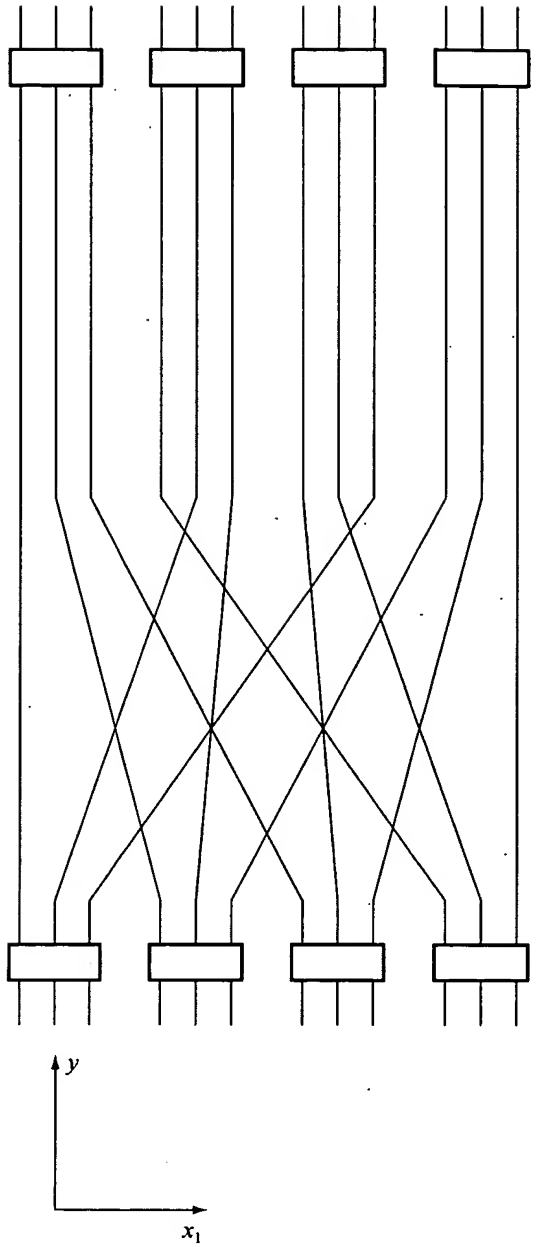


FIG. 18C

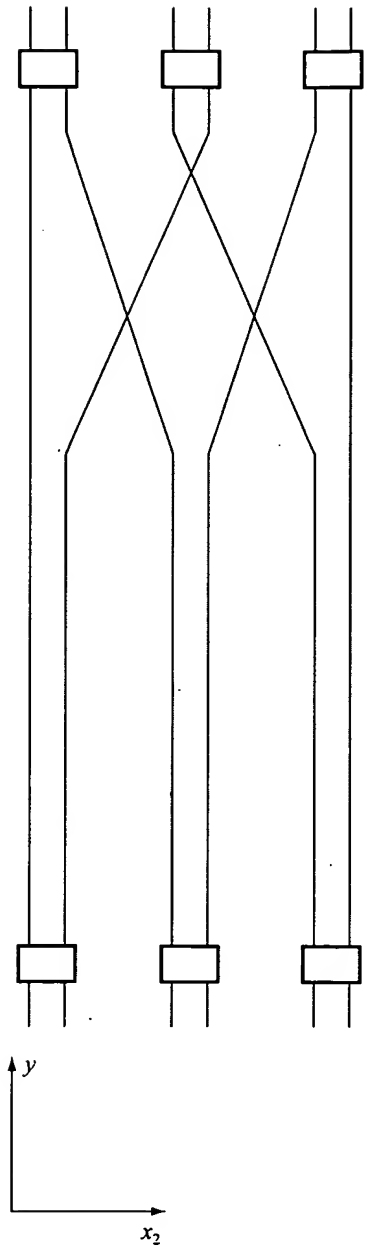
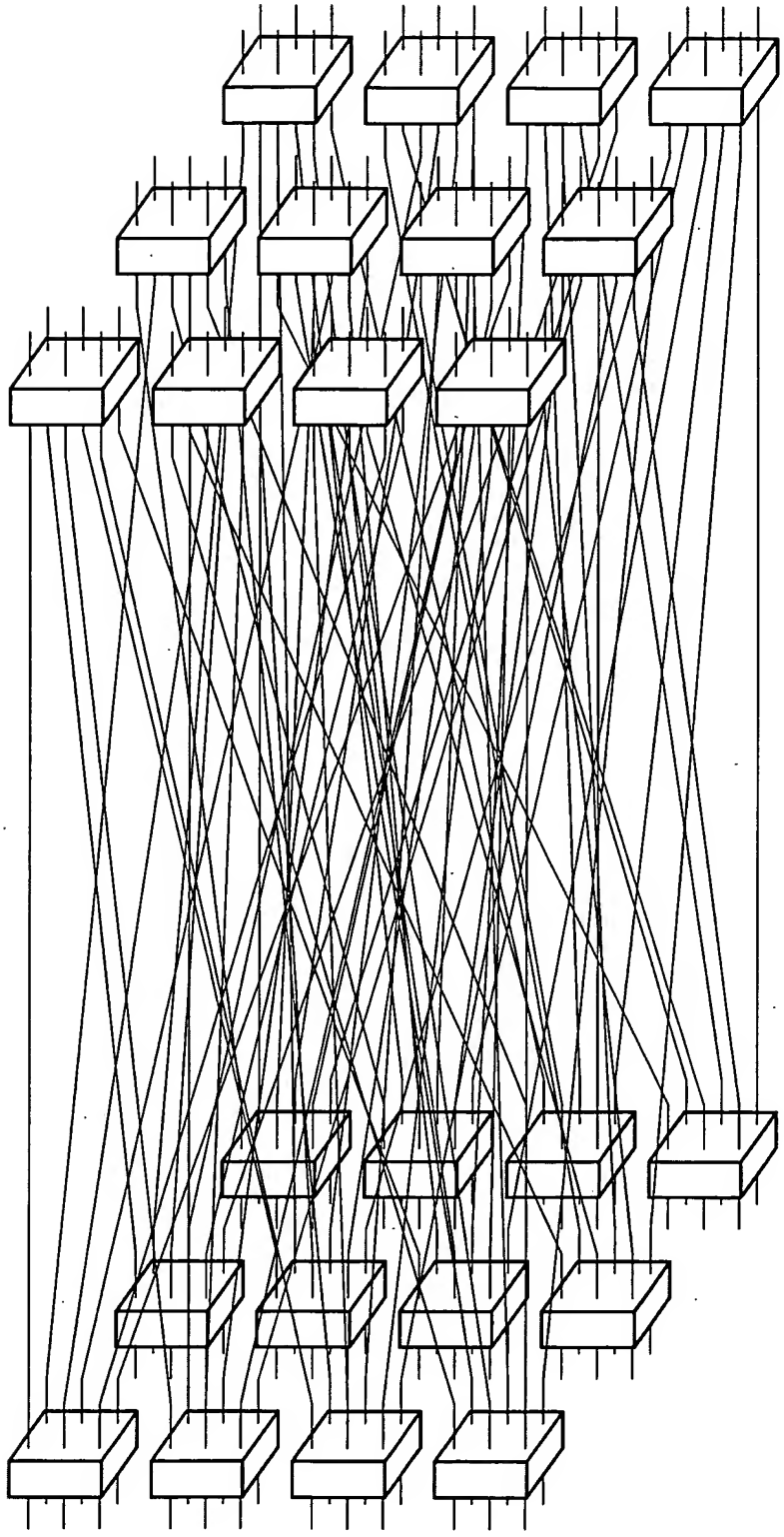


FIG. 18D

FIG. 18E



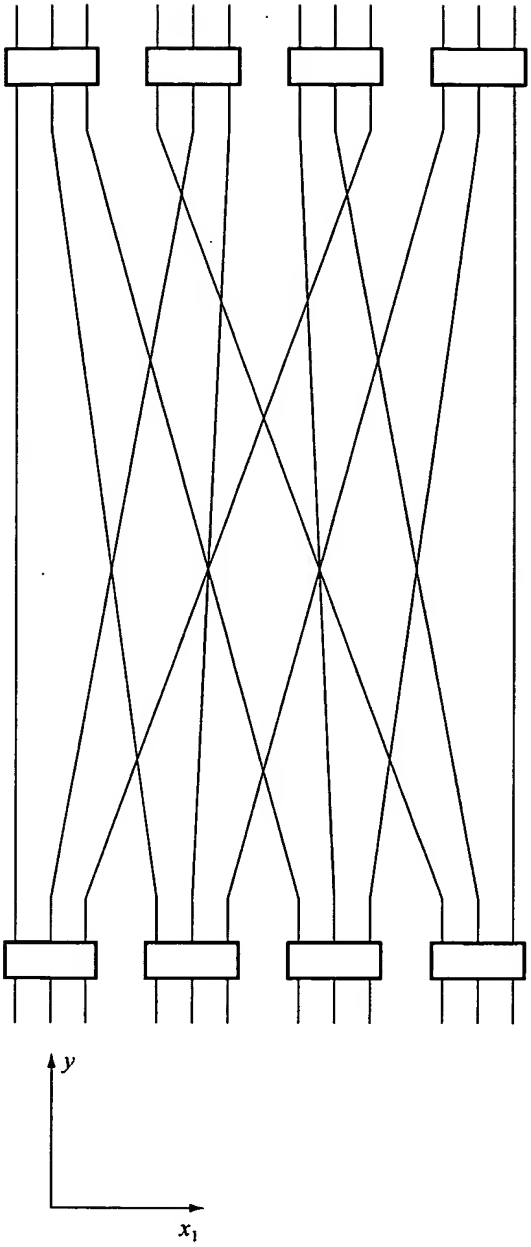


FIG. 18F

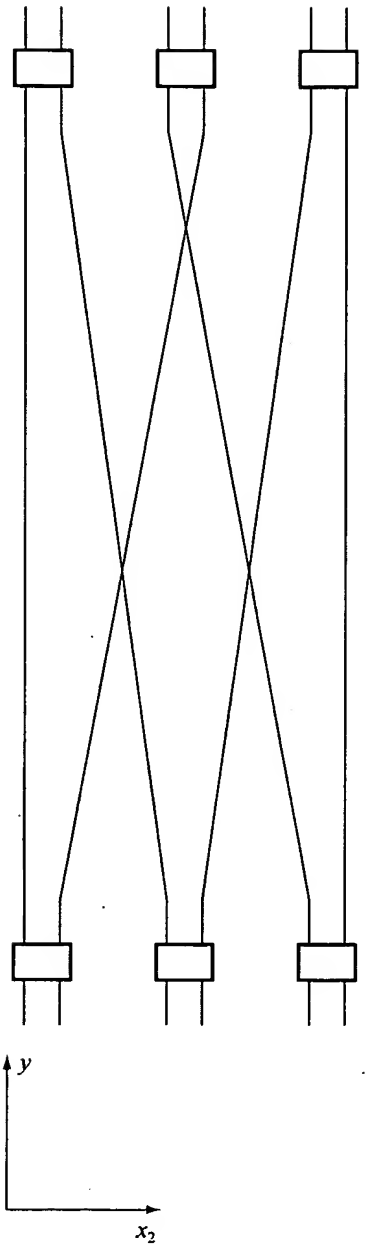
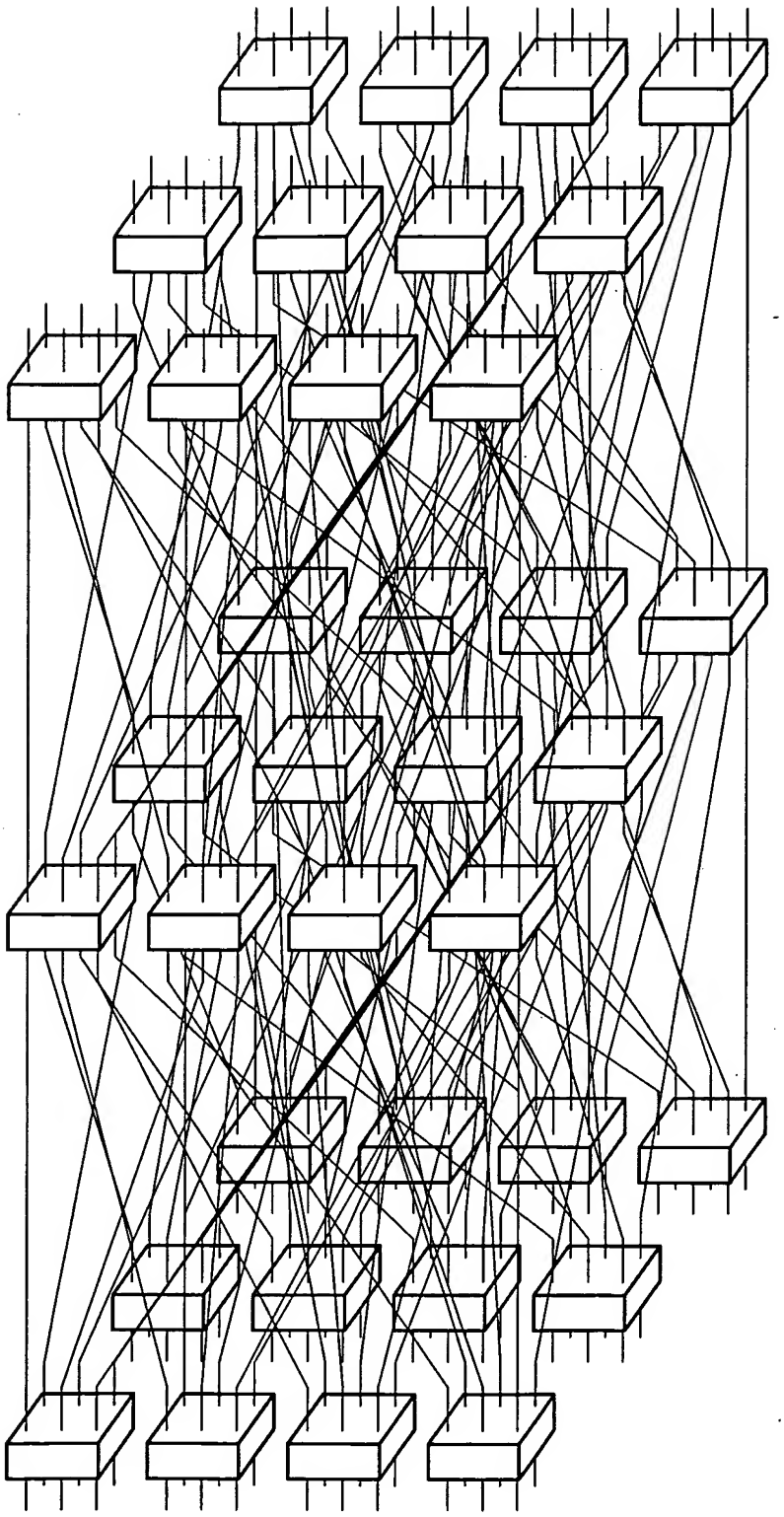


FIG. 18G

FIG. 19



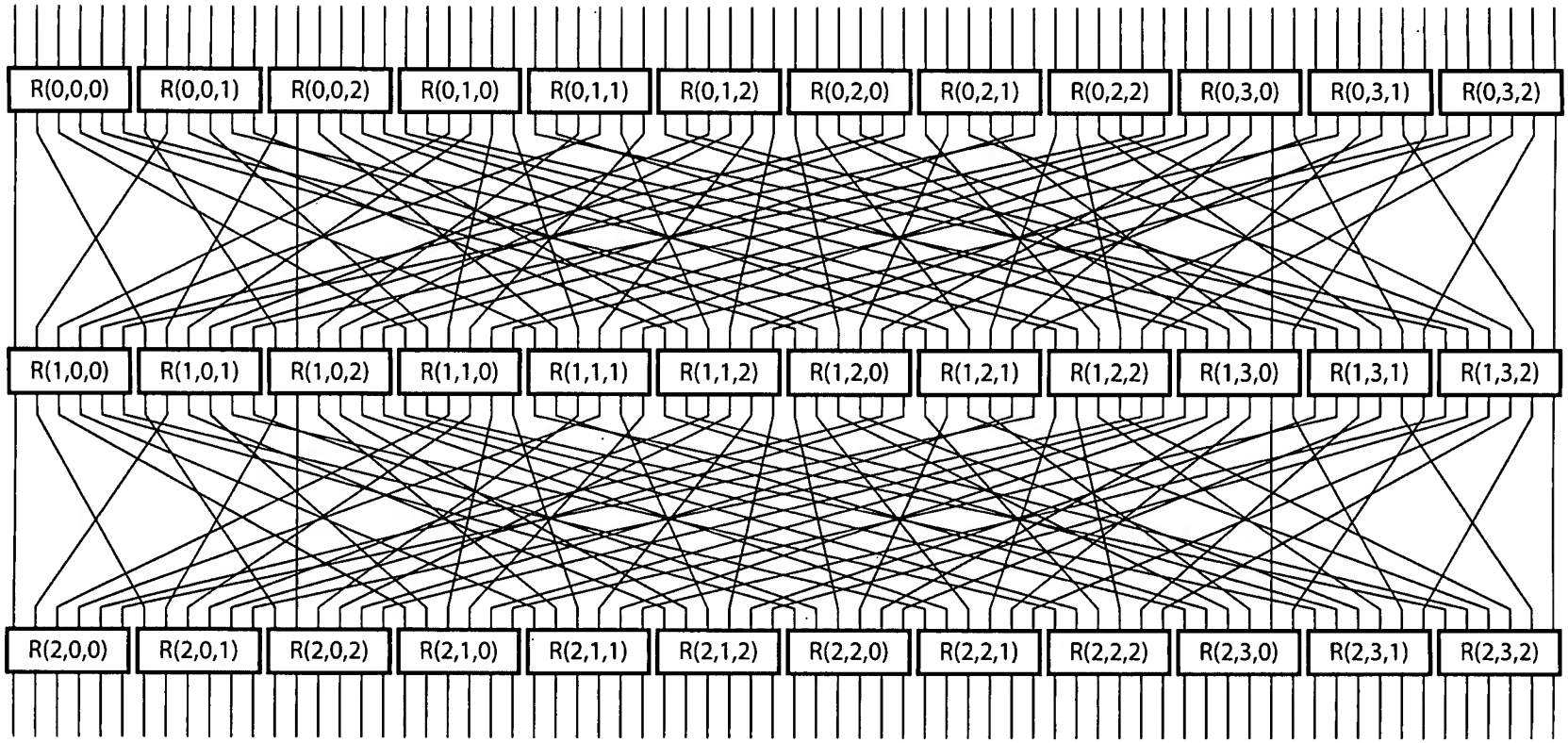


FIG. 20A

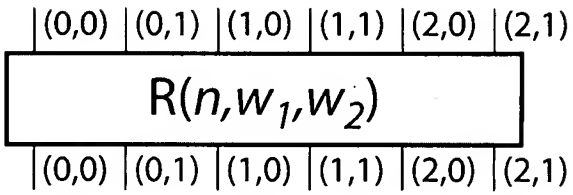


FIG. 20B

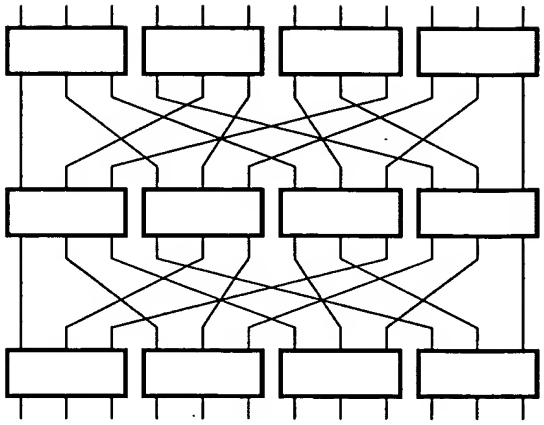


FIG. 21A

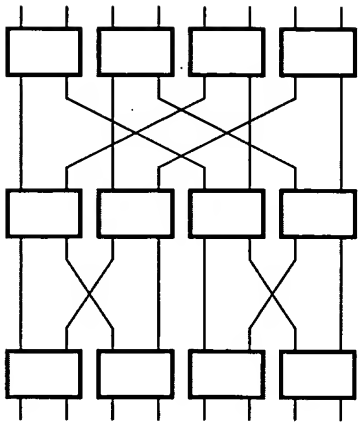


FIG. 21B

0	1	2	3	4	5	6	7	8	9	10	11
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
0	3	6	9	1	4	7	10	2	5	8	11

FIG. 22A

0	1	2	3	4	5	6	7
↓	↓	↓	↓	↓	↓	↓	↓
0	4	2	6	1	5	3	7

FIG. 22B

0	1	2	3	4	5	6	7
↓	↓	↓	↓	↓	↓	↓	↓
0	2	1	3	4	6	5	7

FIG. 22C

(0,0)	(1,0)	(2,0)	(3,0)	(4,0)	(5,0)	(6,0)	(7,0)	(8,0)	(9,0)	(10,0)	(11,0)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,0)	(3,0)	(6,0)	(9,0)	(1,0)	(4,0)	(7,0)	(10,0)	(2,0)	(5,0)	(8,0)	(11,0)
(0,1)	(1,1)	(2,1)	(3,1)	(4,1)	(5,1)	(6,1)	(7,1)	(8,1)	(9,1)	(10,1)	(11,1)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,4)	(3,4)	(6,4)	(9,4)	(1,4)	(4,4)	(7,4)	(10,4)	(2,4)	(5,4)	(8,4)	(11,4)
(0,2)	(1,2)	(2,2)	(3,2)	(4,2)	(5,2)	(6,2)	(7,2)	(8,2)	(9,2)	(10,2)	(11,2)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,2)	(3,2)	(6,2)	(9,2)	(1,2)	(4,2)	(7,2)	(10,2)	(2,2)	(5,2)	(8,2)	(11,2)
(0,3)	(1,3)	(2,3)	(3,3)	(4,3)	(5,3)	(6,3)	(7,3)	(8,3)	(9,3)	(10,3)	(11,3)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,6)	(3,6)	(6,6)	(9,6)	(1,6)	(4,6)	(7,6)	(10,6)	(2,6)	(5,6)	(8,6)	(11,6)
(0,4)	(1,4)	(2,4)	(3,4)	(4,4)	(5,4)	(6,4)	(7,4)	(8,4)	(9,4)	(10,4)	(11,4)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,1)	(3,1)	(6,1)	(9,1)	(1,1)	(4,1)	(7,1)	(10,1)	(2,1)	(5,1)	(8,1)	(11,1)
(0,5)	(1,5)	(2,5)	(3,5)	(4,5)	(5,5)	(6,5)	(7,5)	(8,5)	(9,5)	(10,5)	(11,5)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,5)	(3,5)	(6,5)	(9,5)	(1,5)	(4,5)	(7,5)	(10,5)	(2,5)	(5,5)	(8,5)	(11,5)
(0,6)	(1,6)	(2,6)	(3,6)	(4,6)	(5,6)	(6,6)	(7,6)	(8,6)	(9,6)	(10,6)	(11,6)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,3)	(3,3)	(6,3)	(9,3)	(1,3)	(4,3)	(7,3)	(10,3)	(2,3)	(5,3)	(8,3)	(11,3)
(0,7)	(1,7)	(2,7)	(3,7)	(4,7)	(5,7)	(6,7)	(7,7)	(8,7)	(9,7)	(10,7)	(11,7)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,7)	(3,7)	(6,7)	(9,7)	(1,7)	(4,7)	(7,7)	(10,7)	(2,7)	(5,7)	(8,7)	(11,7)

FIG. 22D

(0,0)	(1,0)	(2,0)	(3,0)	(4,0)	(5,0)	(6,0)	(7,0)	(8,0)	(9,0)	(10,0)	(11,0)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,0)	(3,0)	(6,0)	(9,0)	(1,0)	(4,0)	(7,0)	(10,0)	(2,0)	(5,0)	(8,0)	(11,0)
(0,1)	(1,1)	(2,1)	(3,1)	(4,1)	(5,1)	(6,1)	(7,1)	(8,1)	(9,1)	(10,1)	(11,1)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,2)	(3,2)	(6,2)	(9,2)	(1,2)	(4,2)	(7,2)	(10,2)	(2,2)	(5,2)	(8,2)	(11,2)
(0,2)	(1,2)	(2,2)	(3,2)	(4,2)	(5,2)	(6,2)	(7,2)	(8,2)	(9,2)	(10,2)	(11,2)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,1)	(3,1)	(6,1)	(9,1)	(1,1)	(4,1)	(7,1)	(10,1)	(2,1)	(5,1)	(8,1)	(11,1)
(0,3)	(1,3)	(2,3)	(3,3)	(4,3)	(5,3)	(6,3)	(7,3)	(8,3)	(9,3)	(10,3)	(11,3)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,3)	(3,3)	(6,3)	(9,3)	(1,3)	(4,3)	(7,3)	(10,3)	(2,3)	(5,3)	(8,3)	(11,3)
(0,4)	(1,4)	(2,4)	(3,4)	(4,4)	(5,4)	(6,4)	(7,4)	(8,4)	(9,4)	(10,4)	(11,4)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,4)	(3,4)	(6,4)	(9,4)	(1,4)	(4,4)	(7,4)	(10,4)	(2,4)	(5,4)	(8,4)	(11,4)
(0,5)	(1,5)	(2,5)	(3,5)	(4,5)	(5,5)	(6,5)	(7,5)	(8,5)	(9,5)	(10,5)	(11,5)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,6)	(3,6)	(6,6)	(9,6)	(1,6)	(4,6)	(7,6)	(10,6)	(2,6)	(5,6)	(8,6)	(11,6)
(0,6)	(1,6)	(2,6)	(3,6)	(4,6)	(5,6)	(6,6)	(7,6)	(8,6)	(9,6)	(10,6)	(11,6)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,5)	(3,5)	(6,5)	(9,5)	(1,5)	(4,5)	(7,5)	(10,5)	(2,5)	(5,5)	(8,5)	(11,5)
(0,7)	(1,7)	(2,7)	(3,7)	(4,7)	(5,7)	(6,7)	(7,7)	(8,7)	(9,7)	(10,7)	(11,7)
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
(0,7)	(3,7)	(6,7)	(9,7)	(1,7)	(4,7)	(7,7)	(10,7)	(2,7)	(5,7)	(8,7)	(11,7)

FIG. 22E

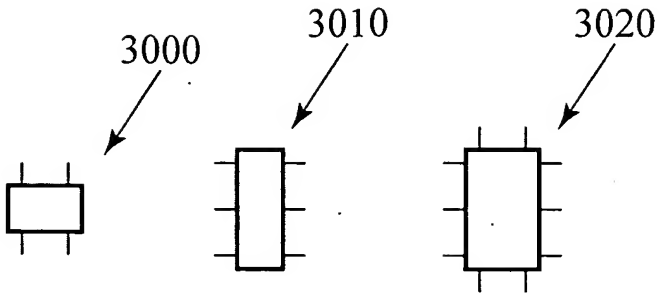


FIG. 23

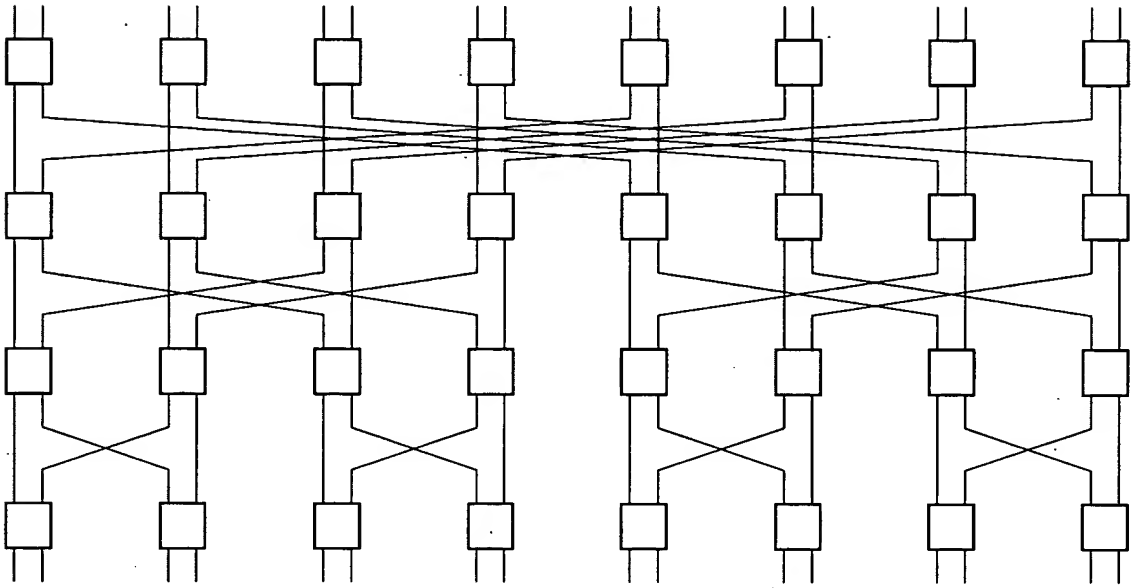


FIG. 24A

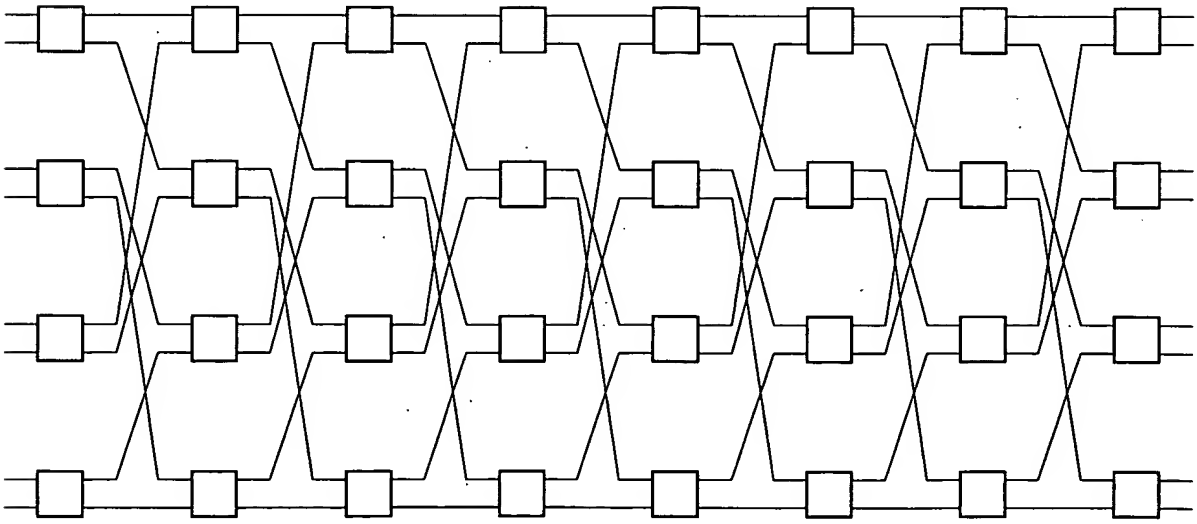


FIG. 24B

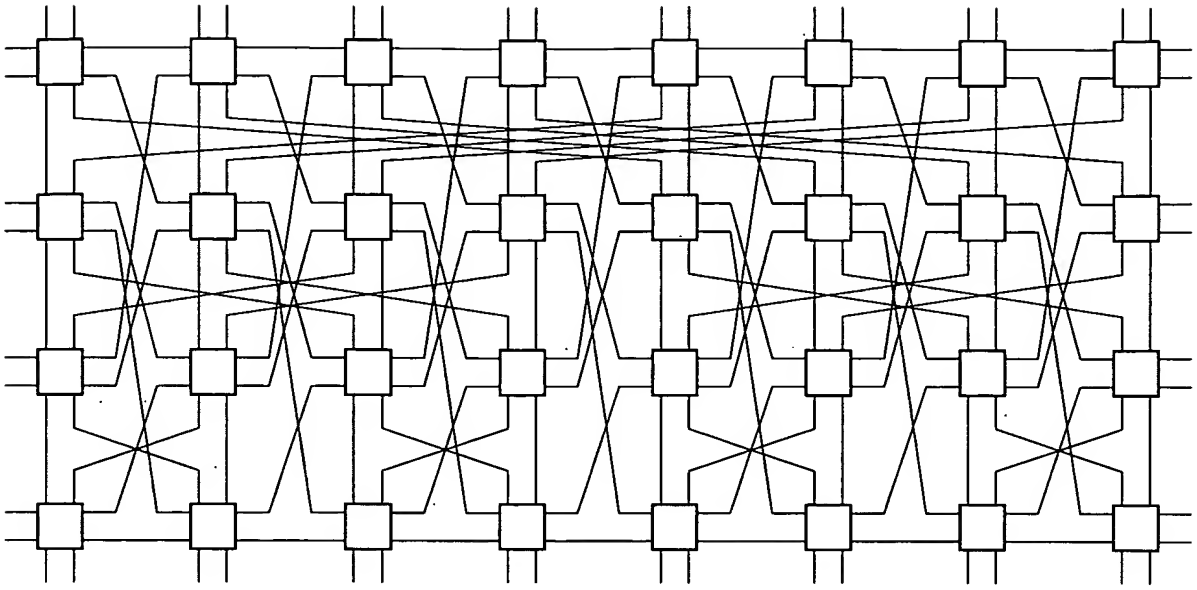


FIG. 24C

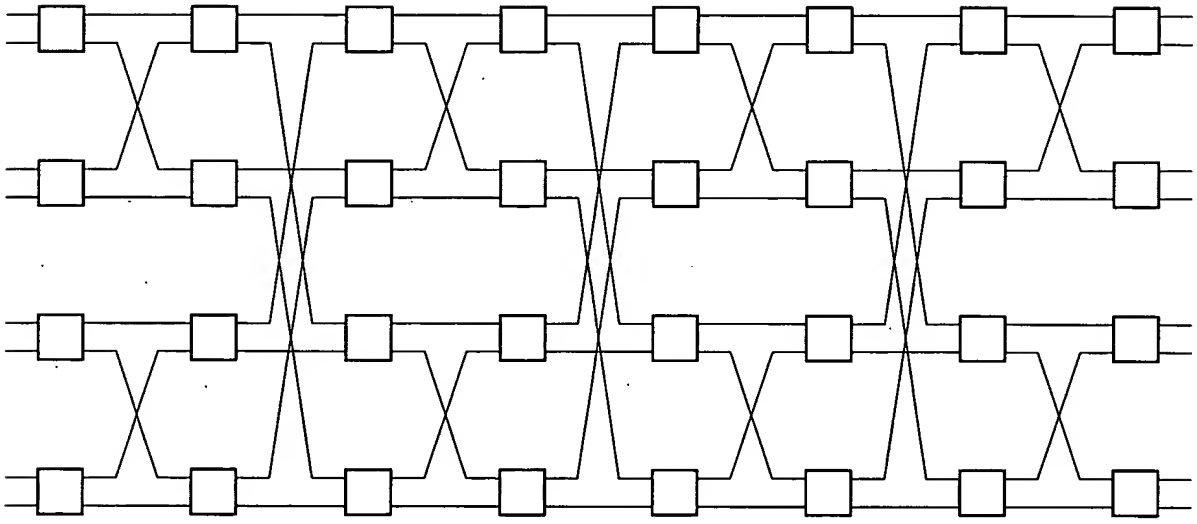


FIG. 24D

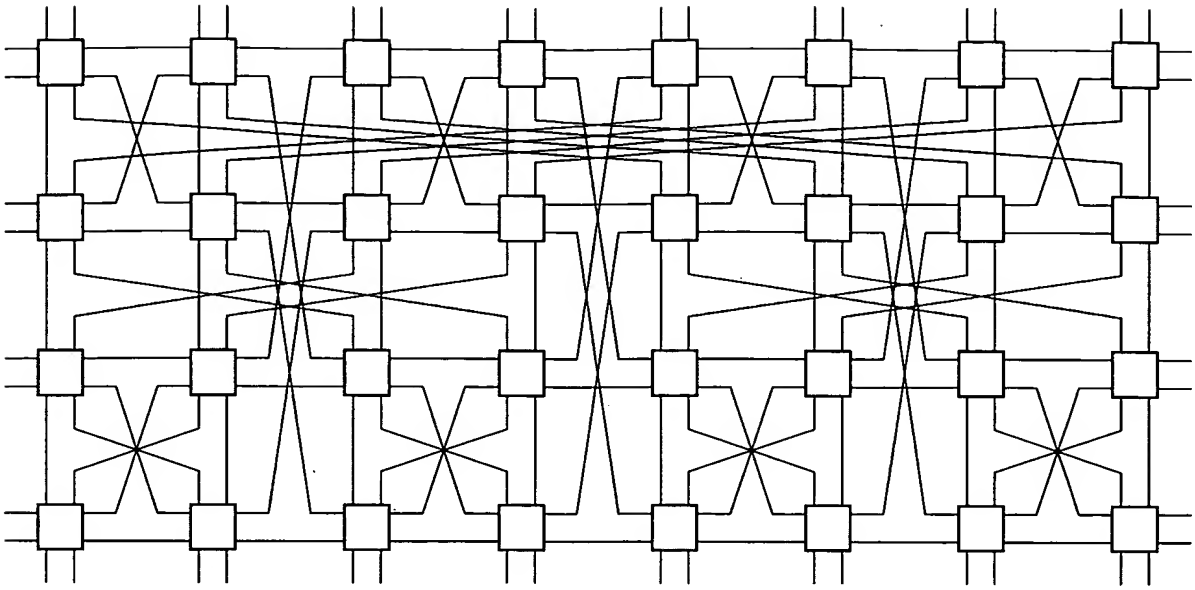


FIG. 24E

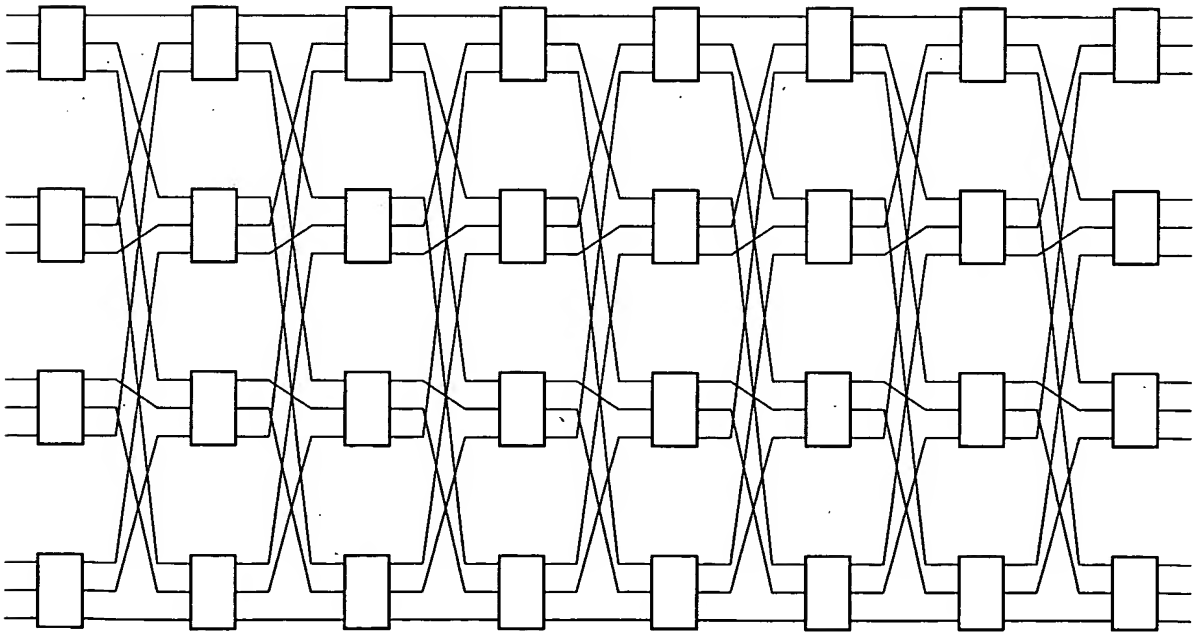


FIG. 25A

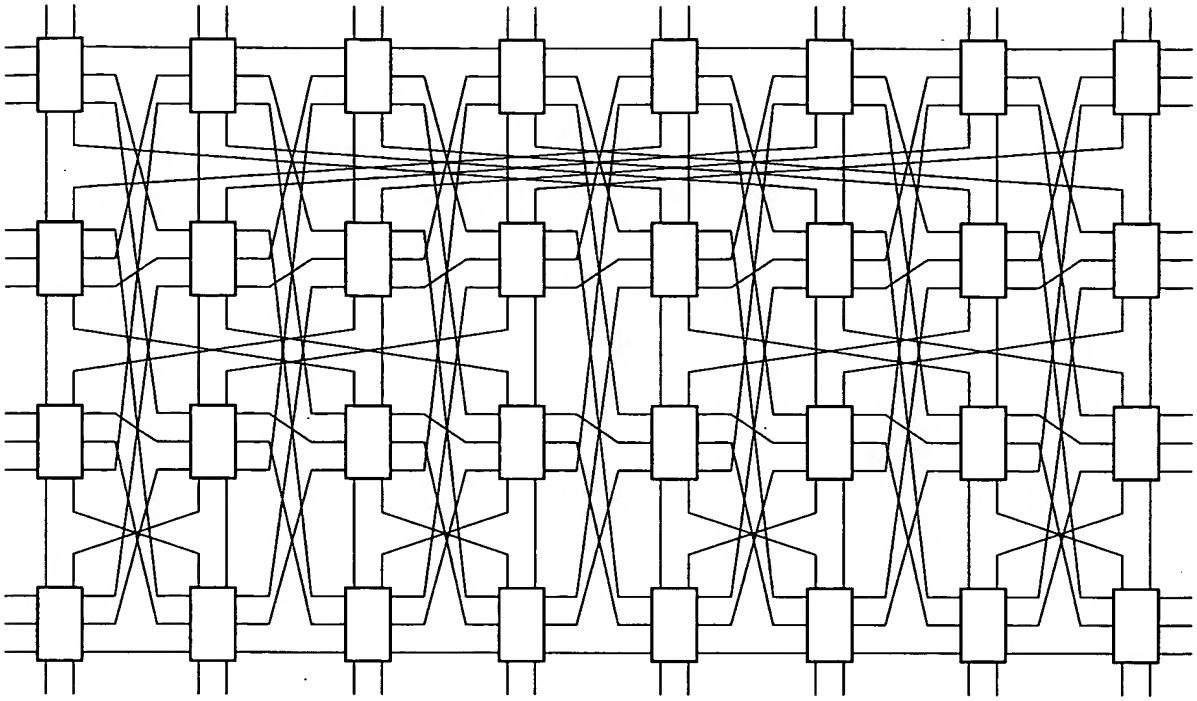


FIG. 25B

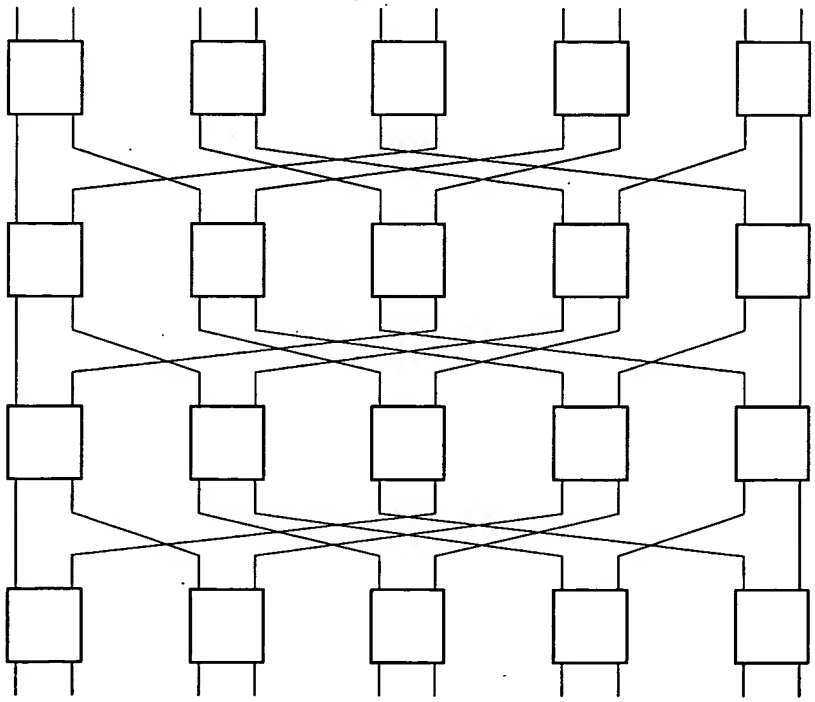


FIG. 26A

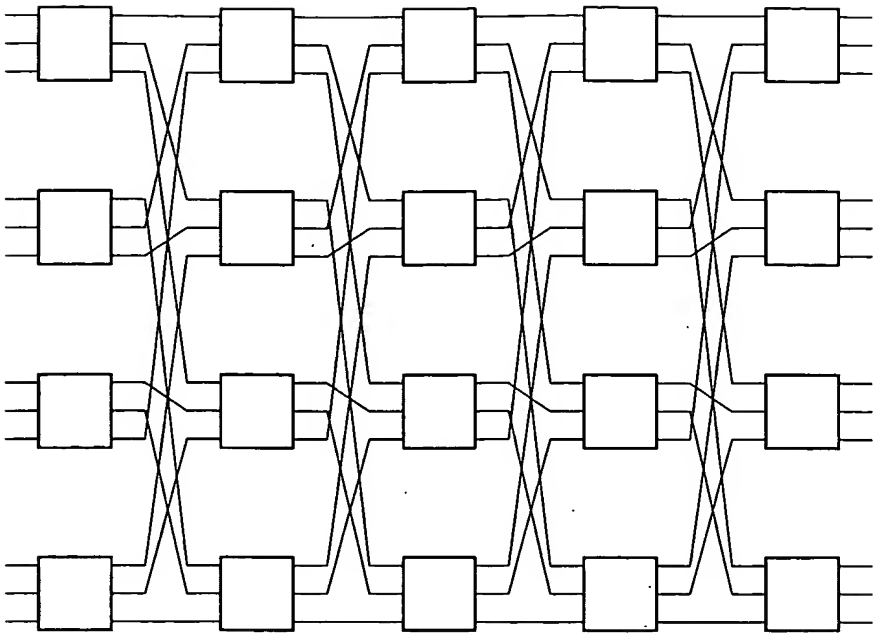


FIG. 26B

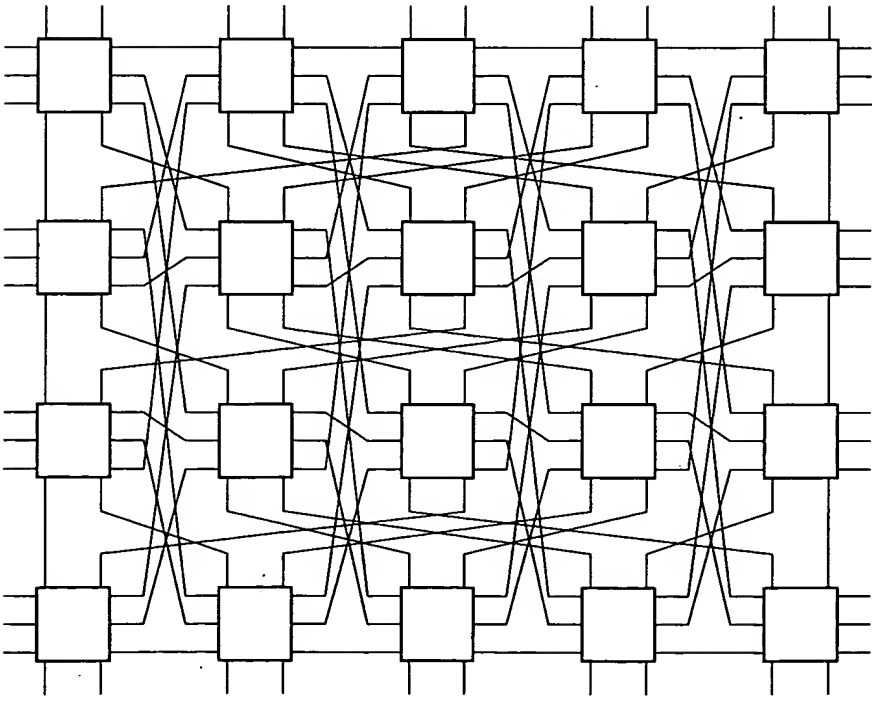


FIG. 26C

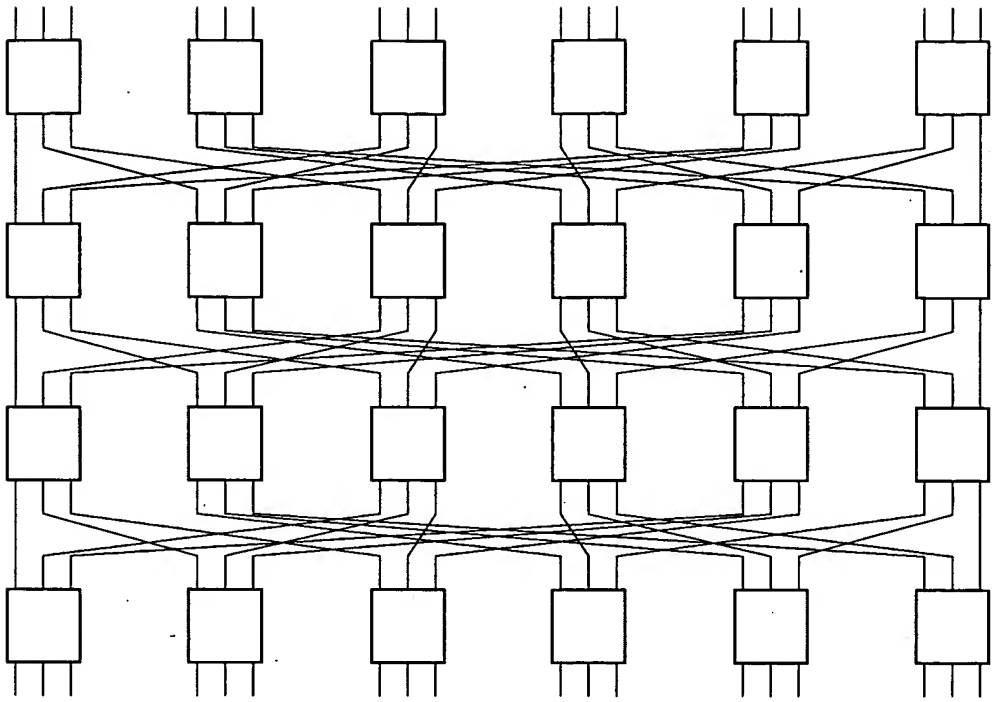


FIG. 27A

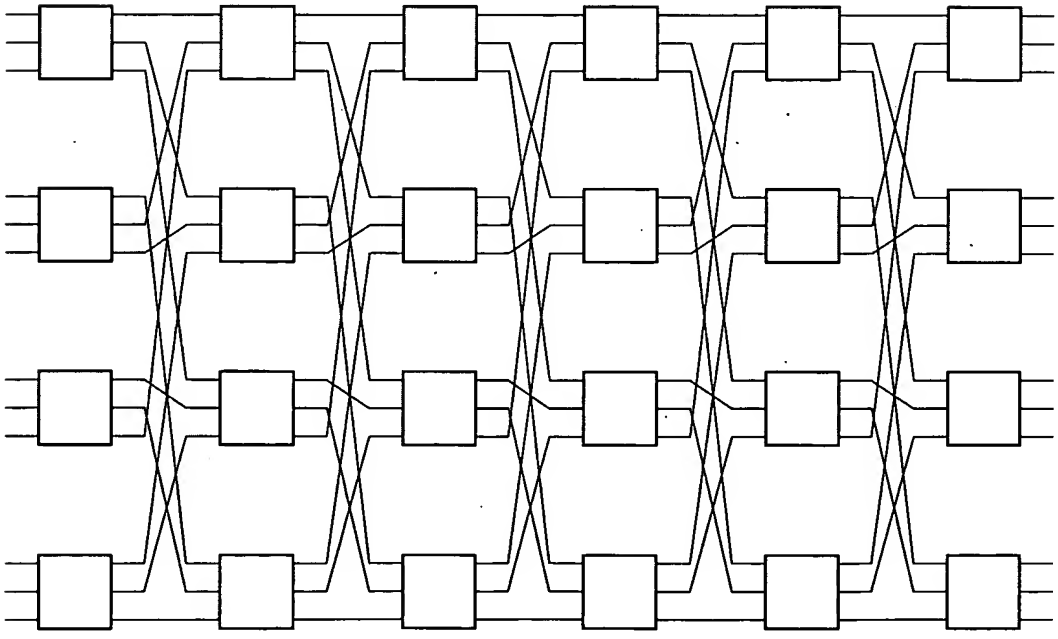


FIG. 27B

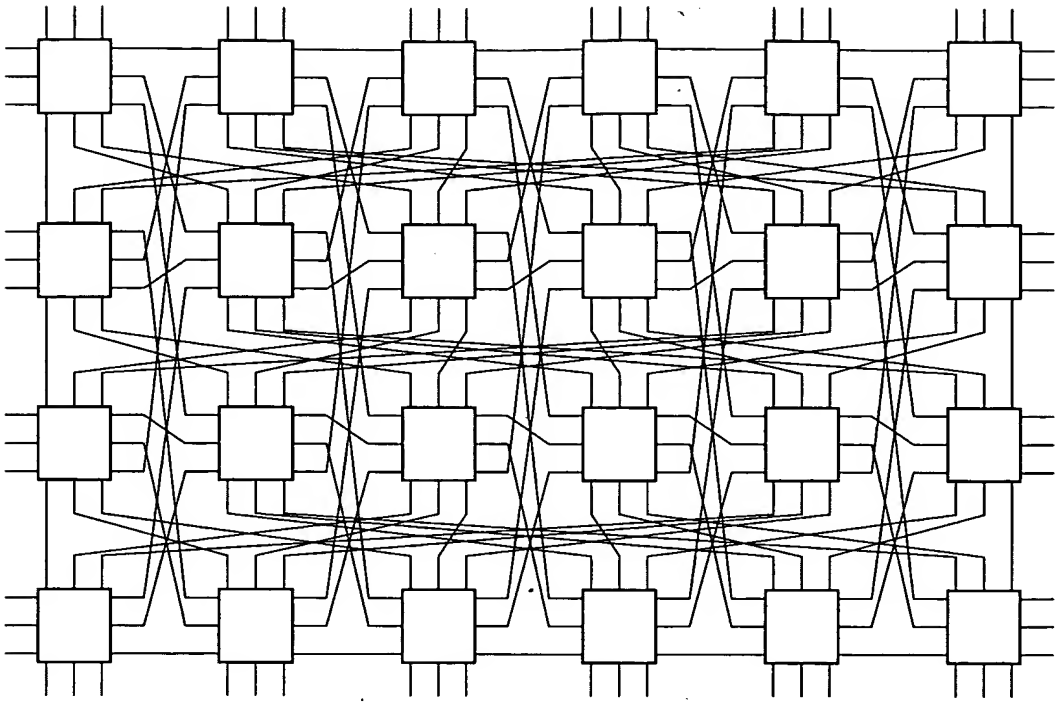


FIG. 27C

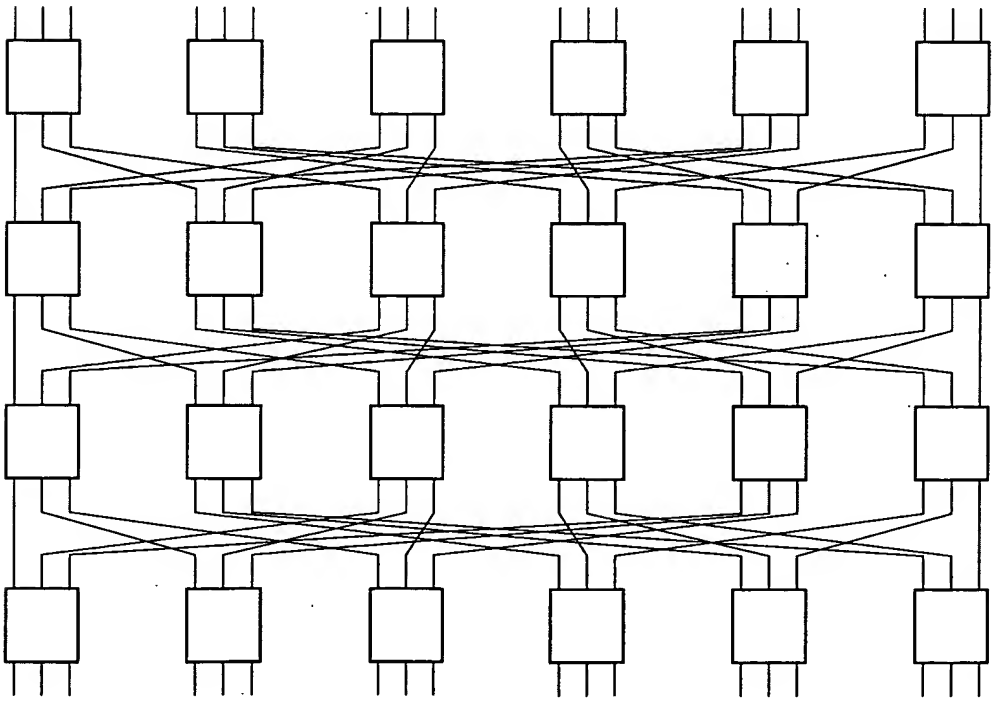


FIG. 28A

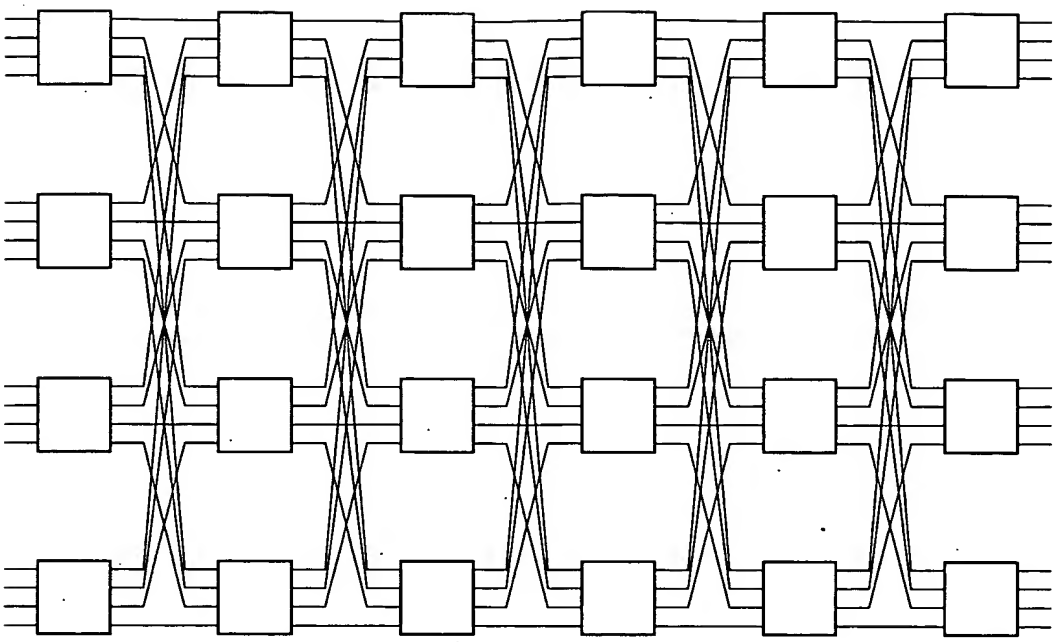


FIG. 28B

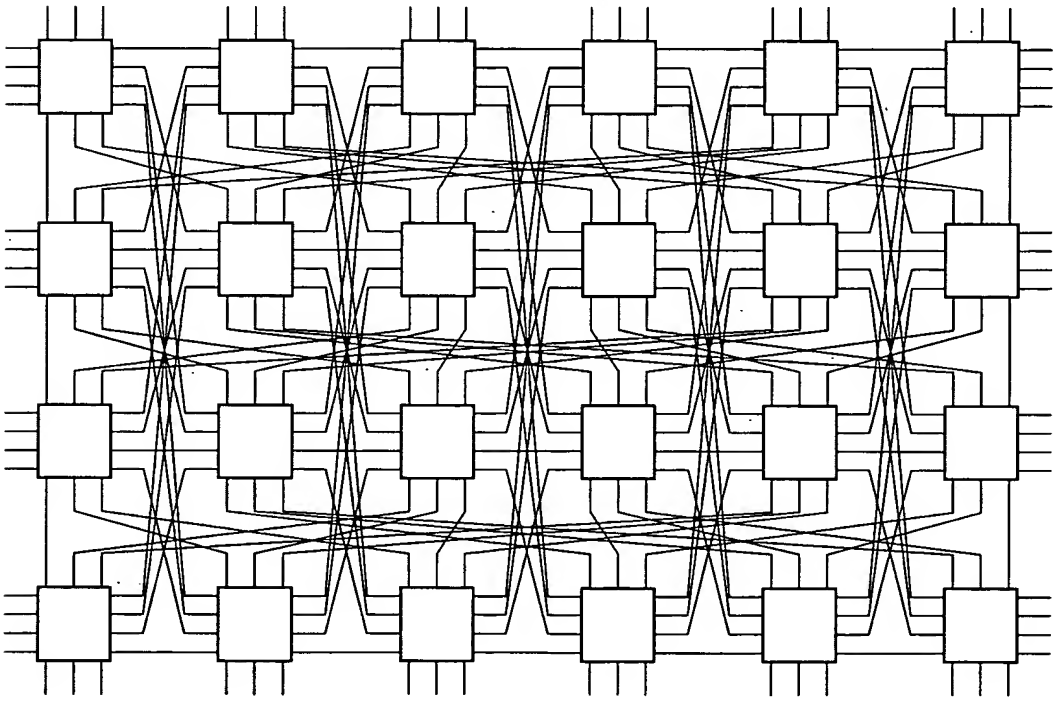


FIG. 28C

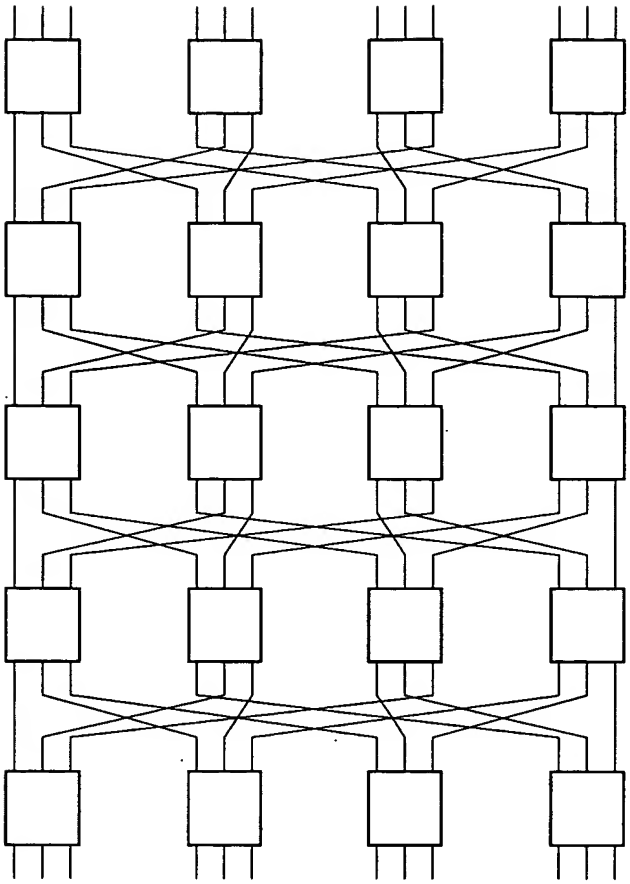


FIG. 29A

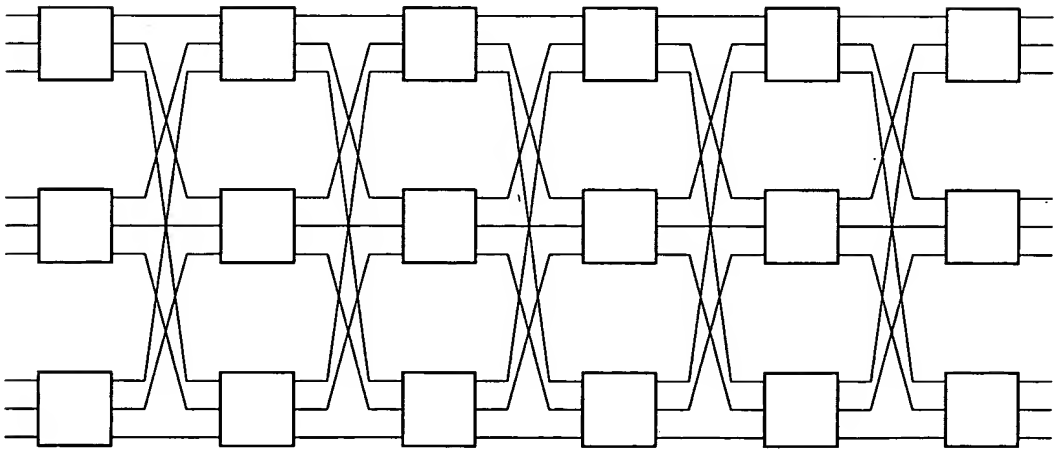


FIG. 29B

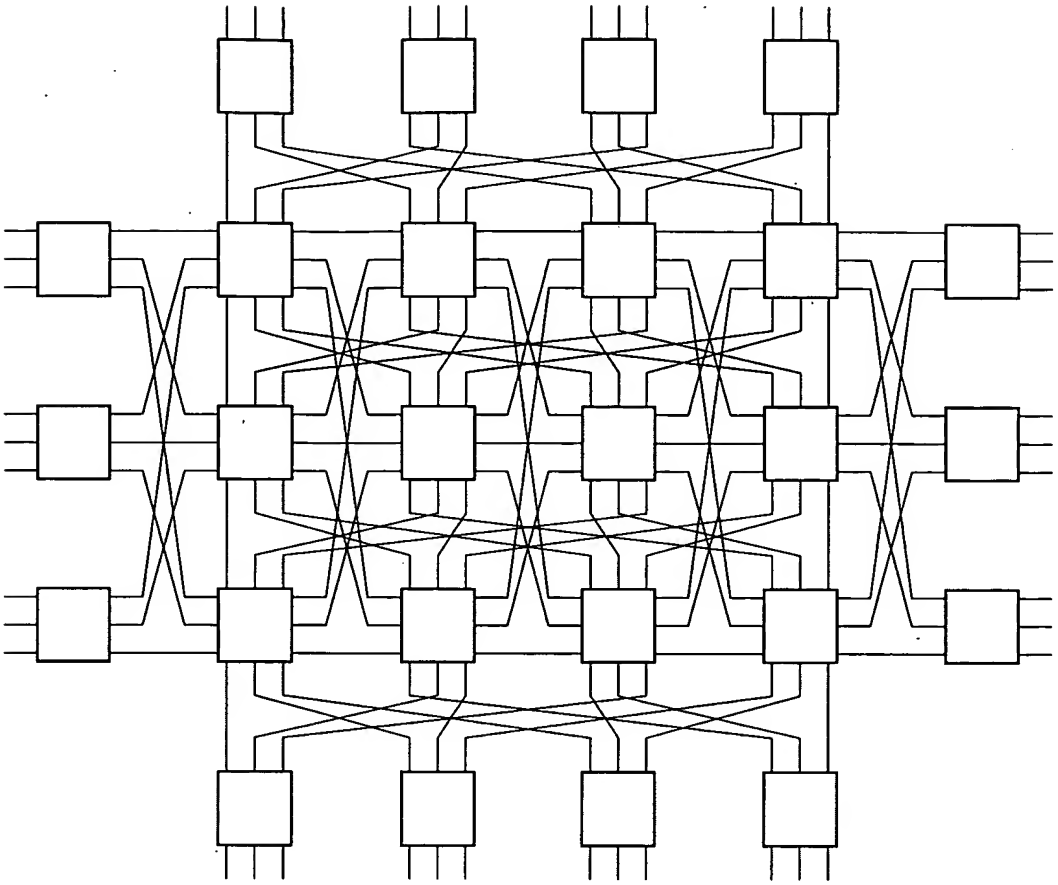


FIG. 29C

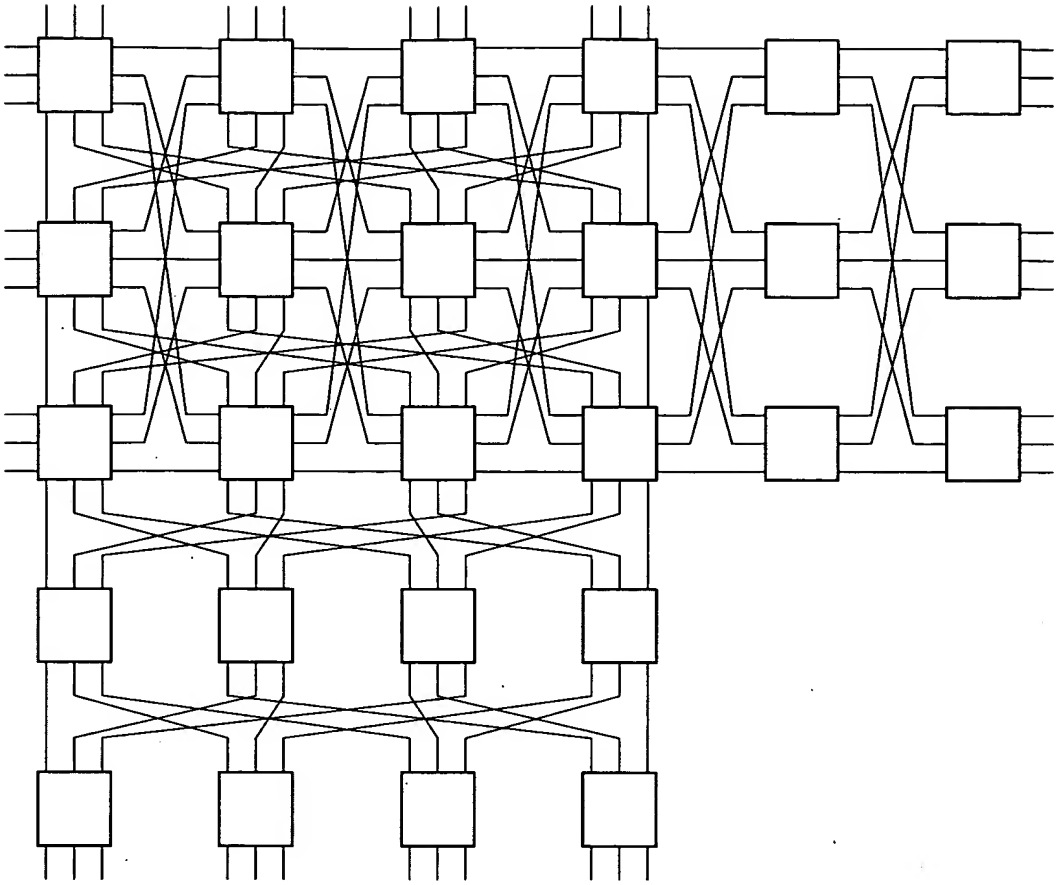


FIG. 29D

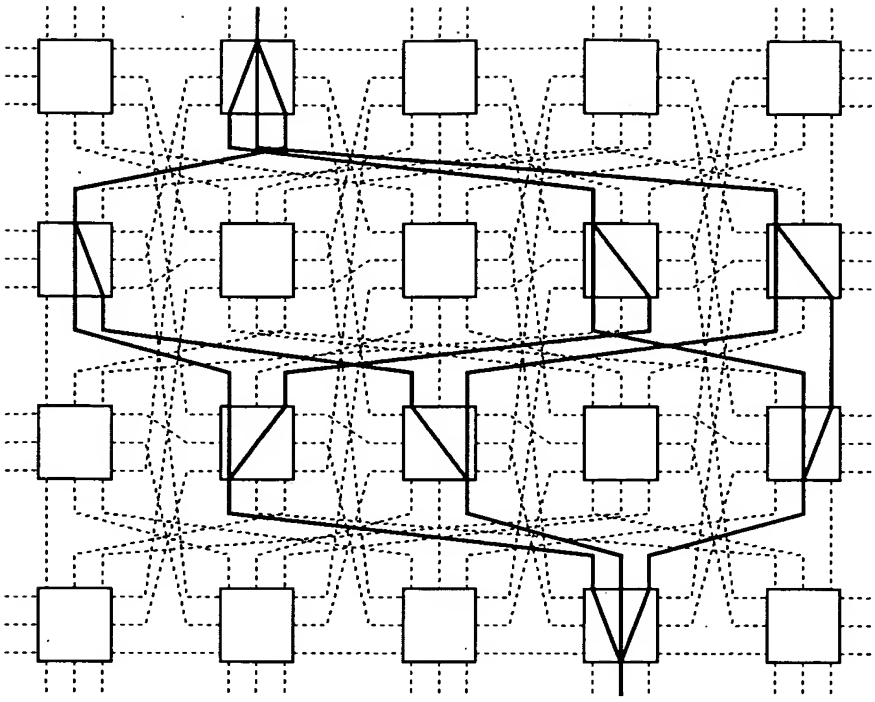


FIG. 30A

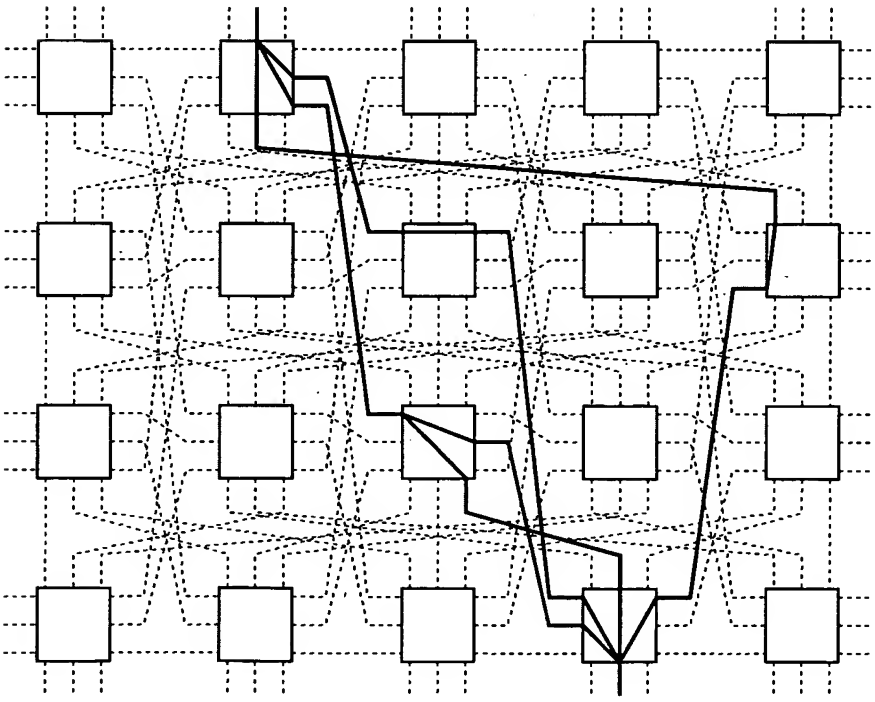


FIG. 30B

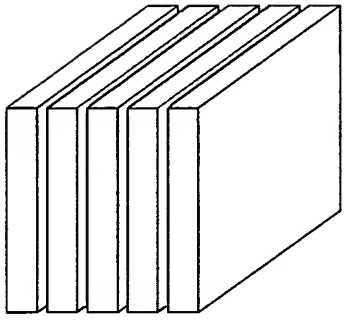


FIG. 31A

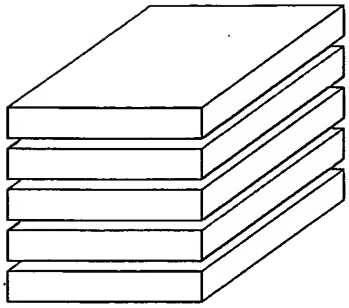


FIG. 31B

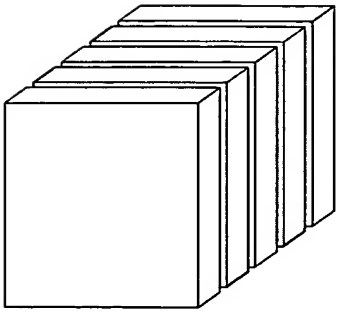


FIG. 31C

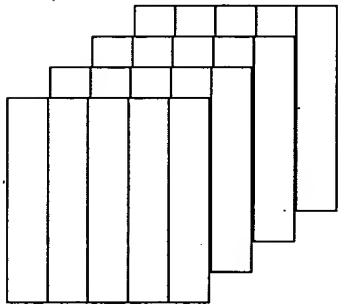


FIG. 32A

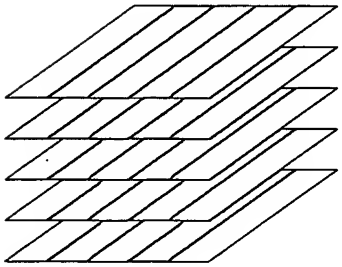


FIG. 32B

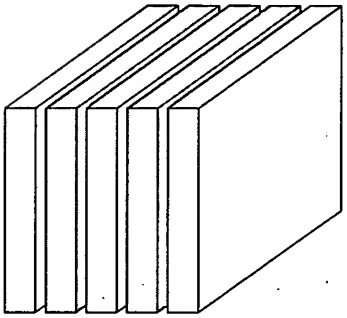


FIG. 32C

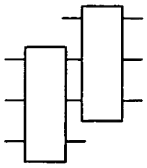


FIG. 33A

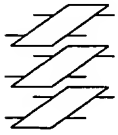


FIG. 33B

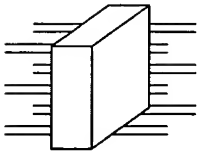


FIG. 33C

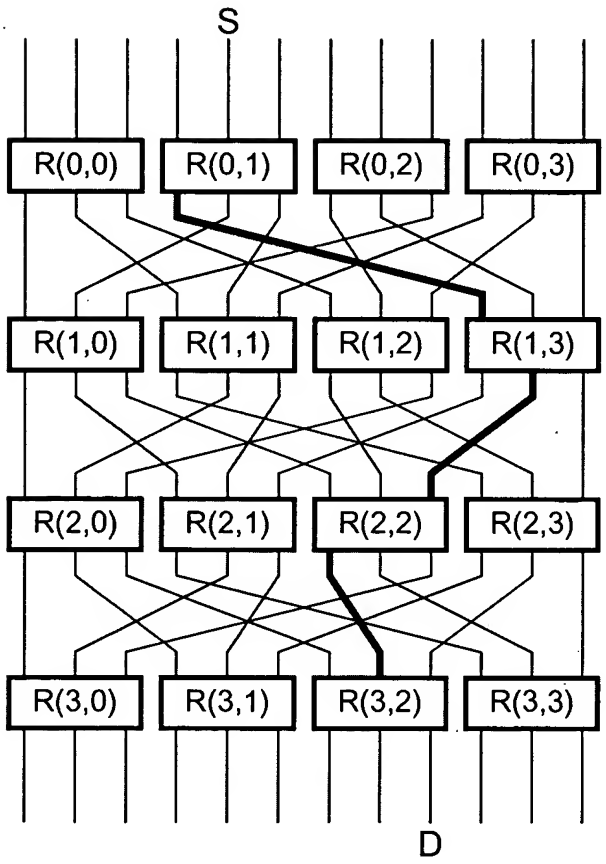

S
R(0,0)
R(0,1)
R(0,2)
R(0,3)
R(1,0)
R(1,1)
R(1,2)
R(1,3)
R(2,0)
R(2,1)
R(2,2)
R(2,3)
R(3,0)
R(3,1)
R(3,2)
R(3,3)
D

FIG. 34

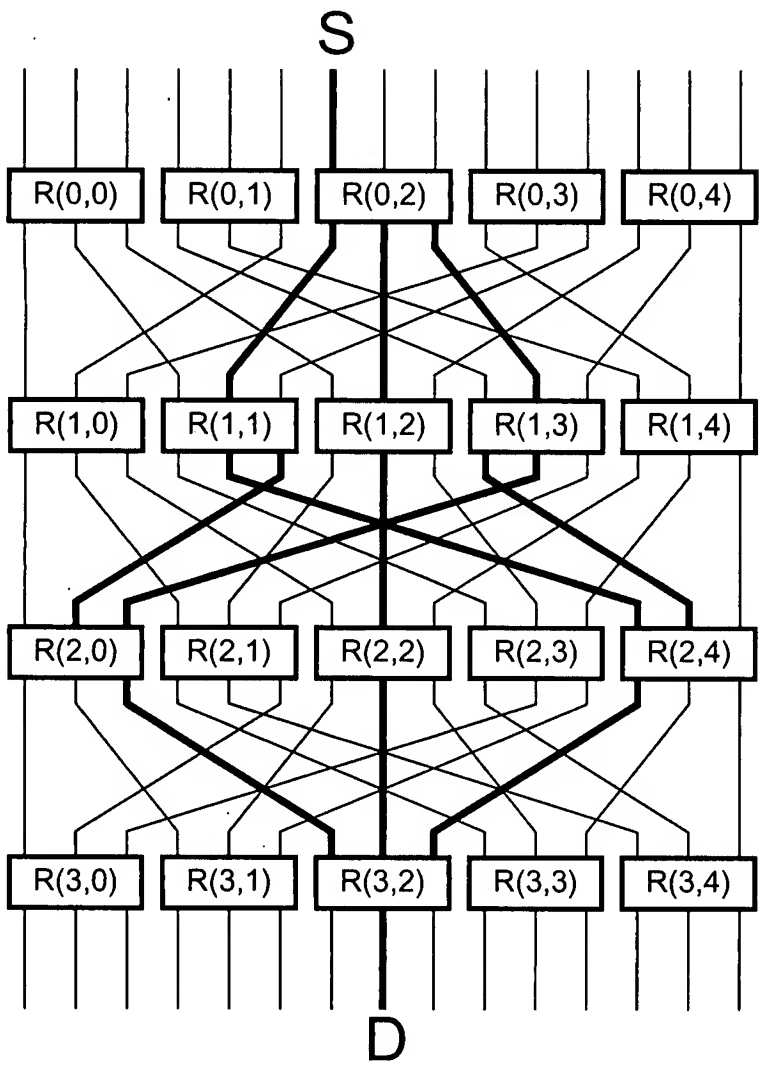


FIG. 35A

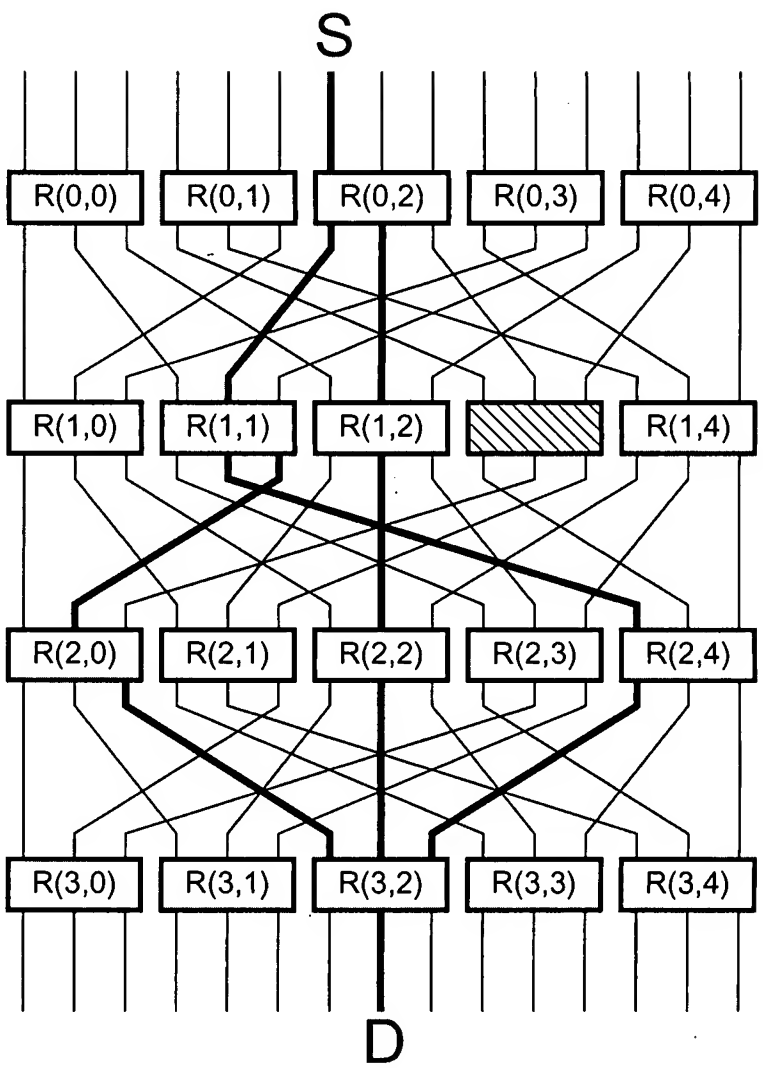


FIG. 35B

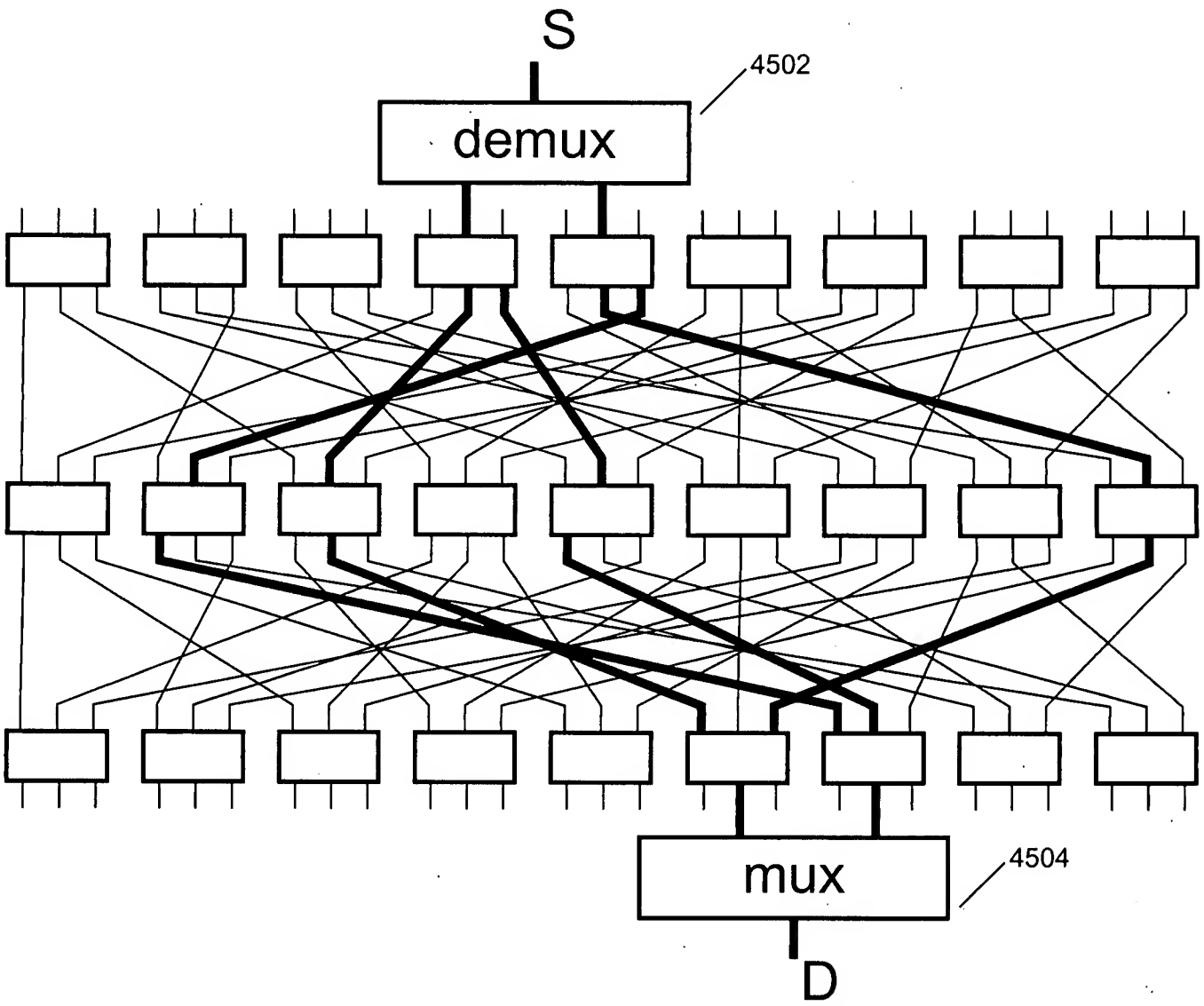


FIG. 36

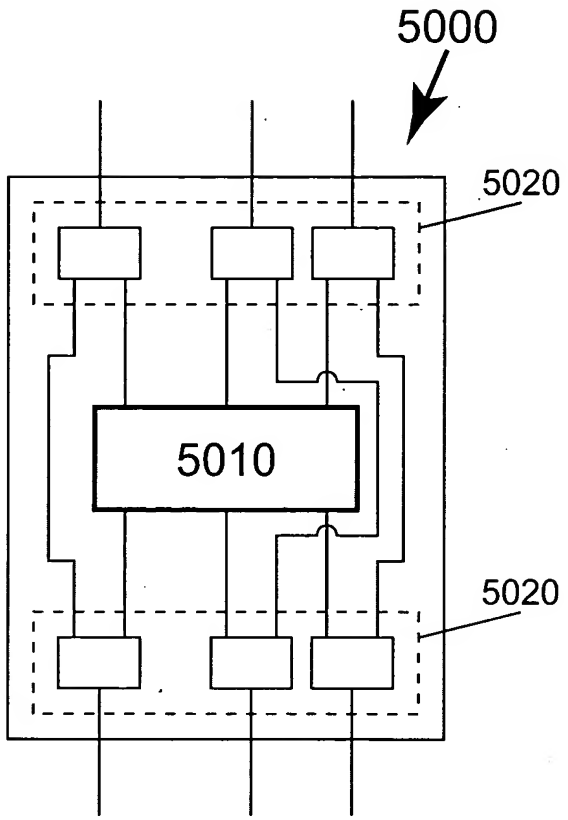


FIG. 37

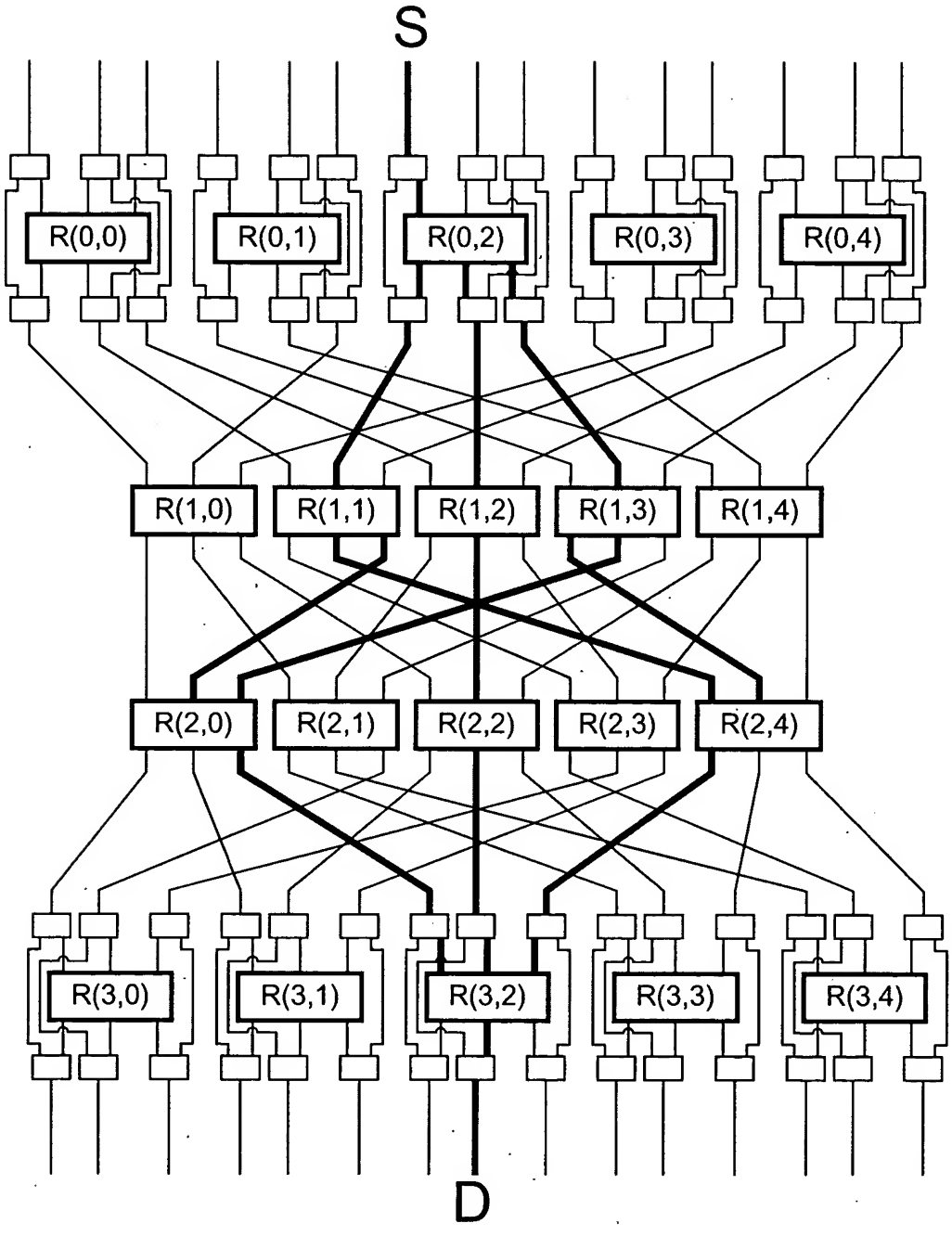

S
R(0,0)
R(0,1)
R(0,2)
R(0,3)
R(0,4)
R(1,0)
R(1,1)
R(1,2)
R(1,3)
R(1,4)
R(2,0)
R(2,1)
R(2,2)
R(2,3)
R(2,4)
R(3,0)
R(3,1)
R(3,2)
R(3,3)
R(3,4)
D

FIG. 38A

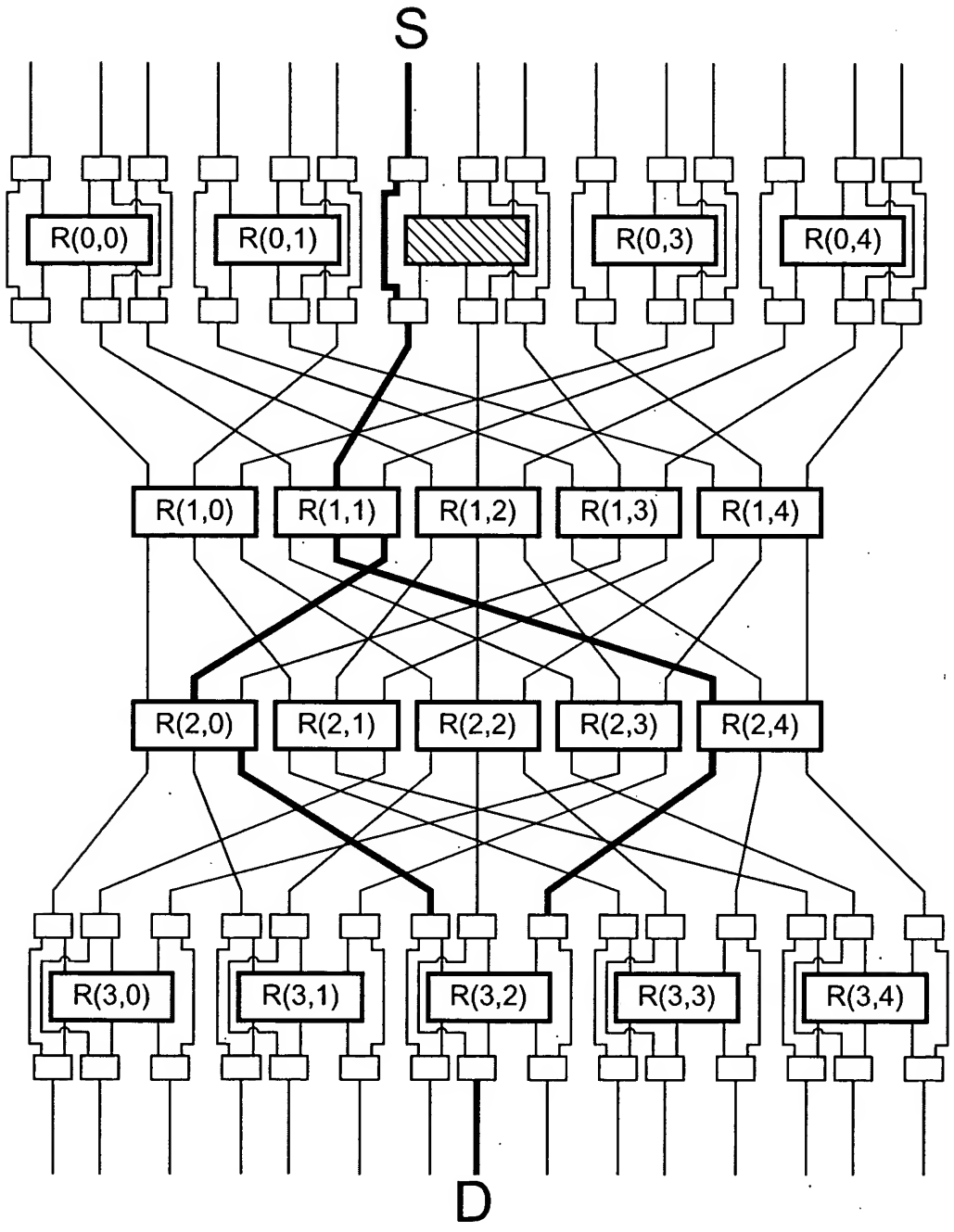

S
R(0,0)
R(0,1)
R(0,3)
R(0,4)
R(1,0)
R(1,1)
R(1,2)
R(1,3)
R(1,4)
R(2,0)
R(2,1)
R(2,2)
R(2,3)
R(2,4)
R(3,0)
R(3,1)
R(3,2)
R(3,3)
R(3,4)
D

FIG. 38B

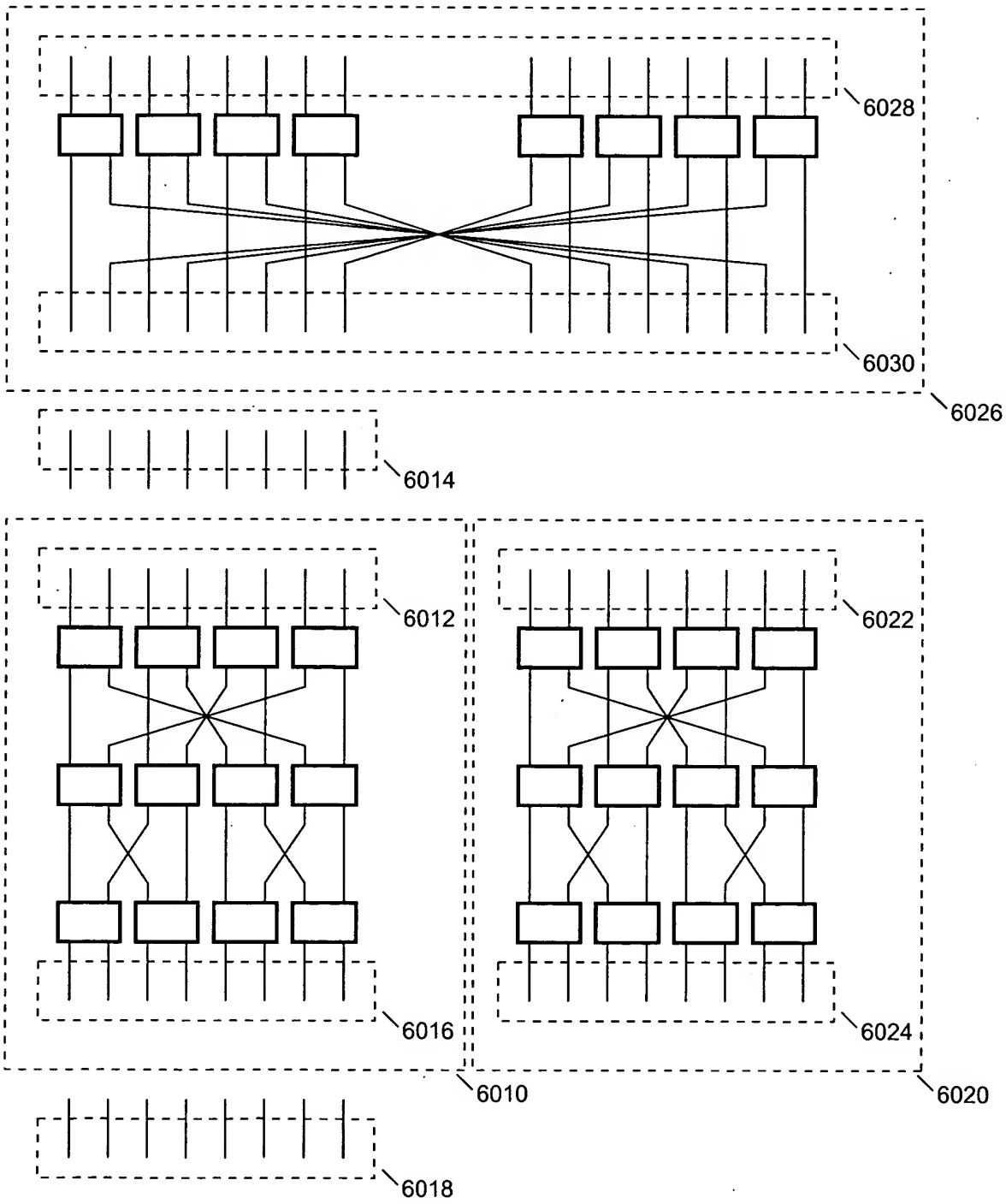
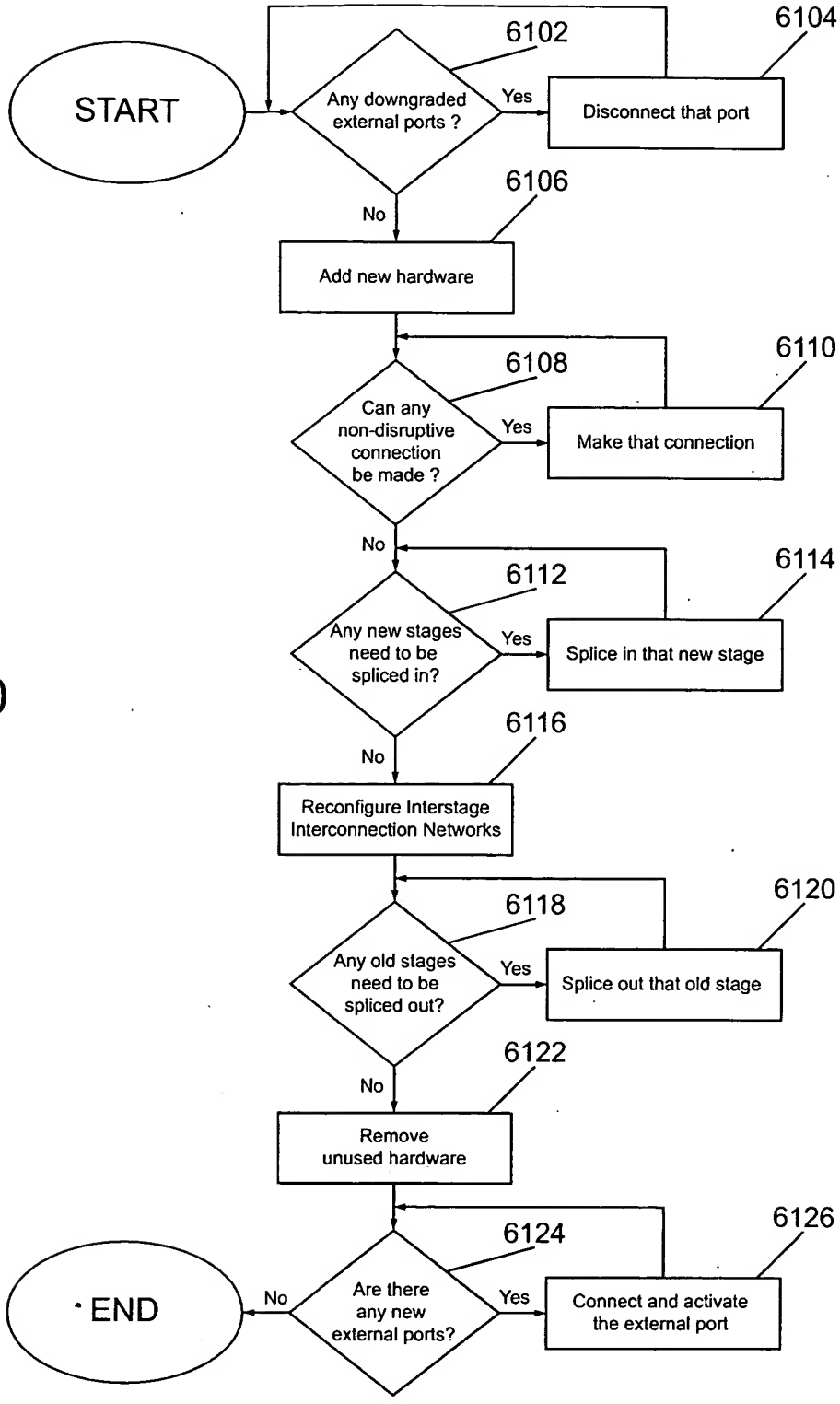


FIG. 39

FIG. 40


START
6102
Any downgraded external ports ?
Yes
6104
Disconnect that port
No
6106
Add new hardware
6108
Can any non-disruptive connection be made ?
Yes
6110
Make that connection
No
6112
Any new stages need to be spliced in?
Yes
6114
Splice in that new stage
No
6116
Reconfigure Interstage Interconnection Networks
6118
Any old stages need to be spliced out?
Yes
6120
Splice out that old stage
No
6122
Remove unused hardware
6124
Are there any new external ports?
No
Yes
6126
Connect and activate the external port
END

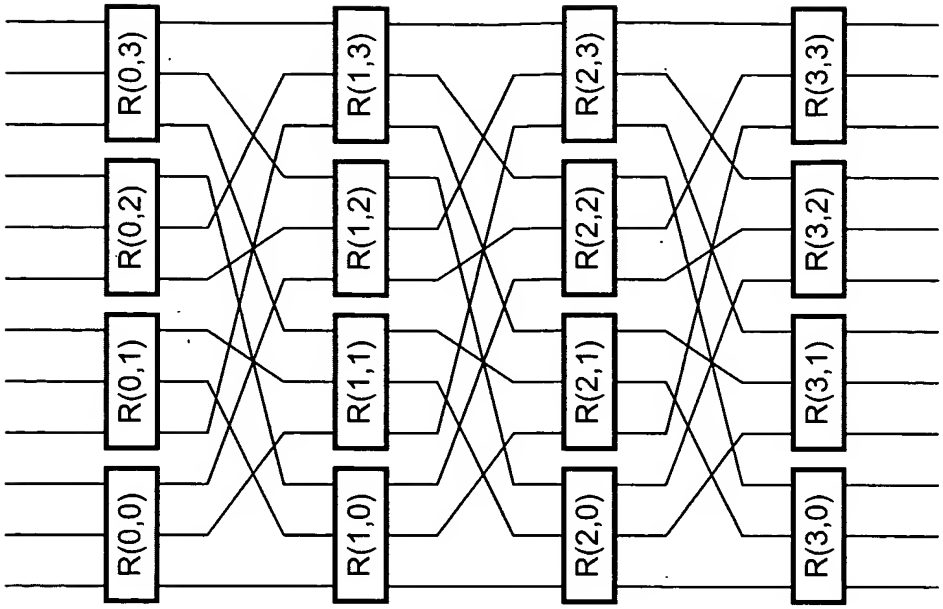


FIG. 42A

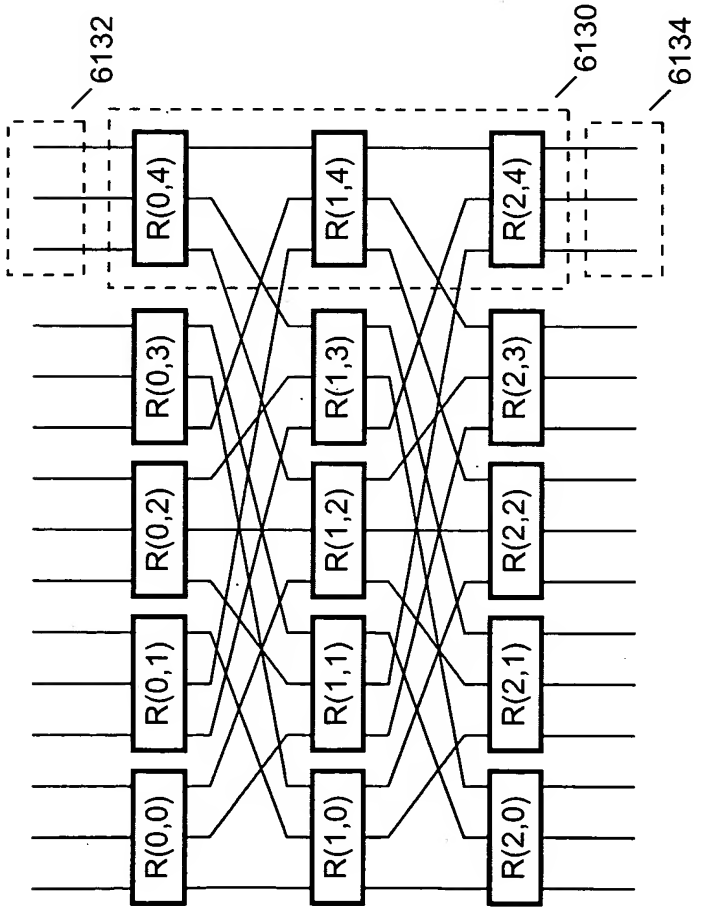


FIG. 41

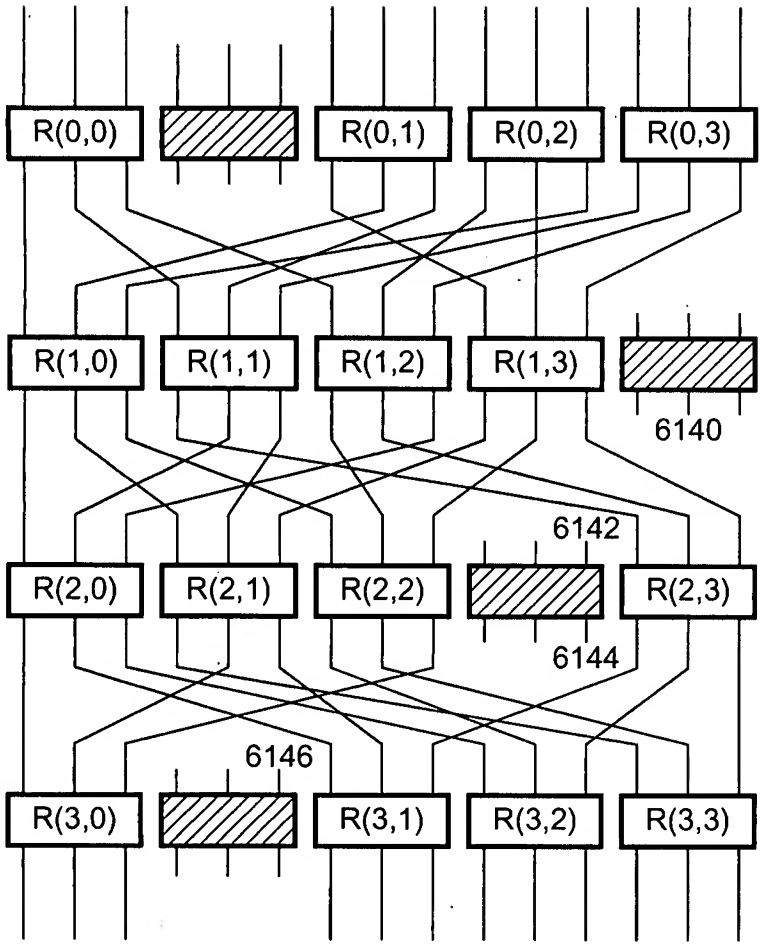


FIG. 42B

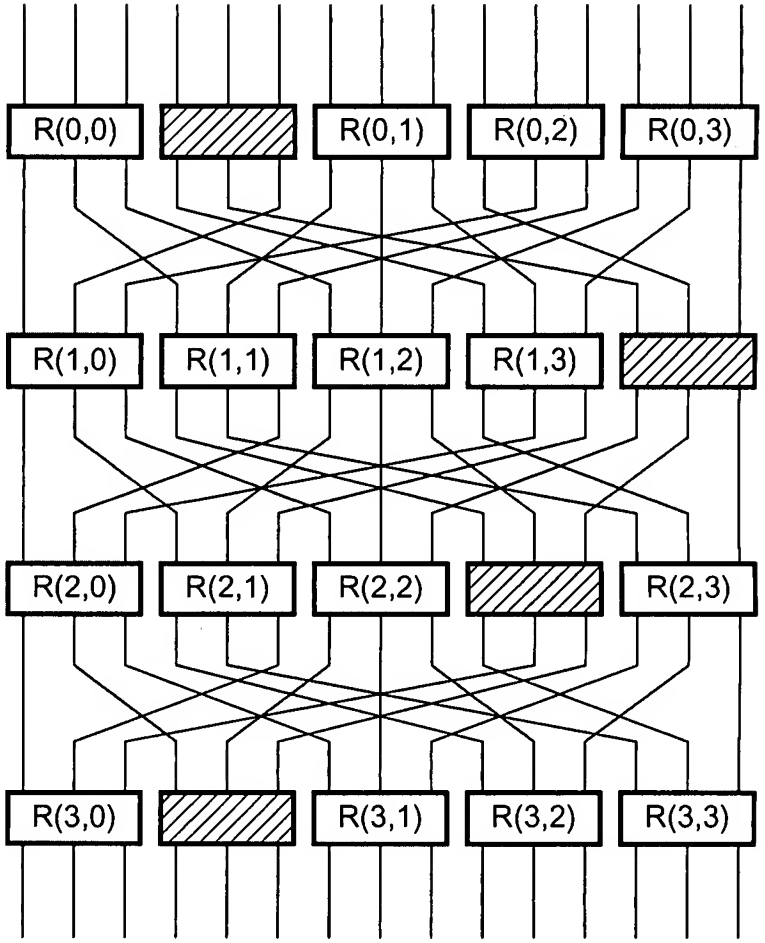


FIG. 42C

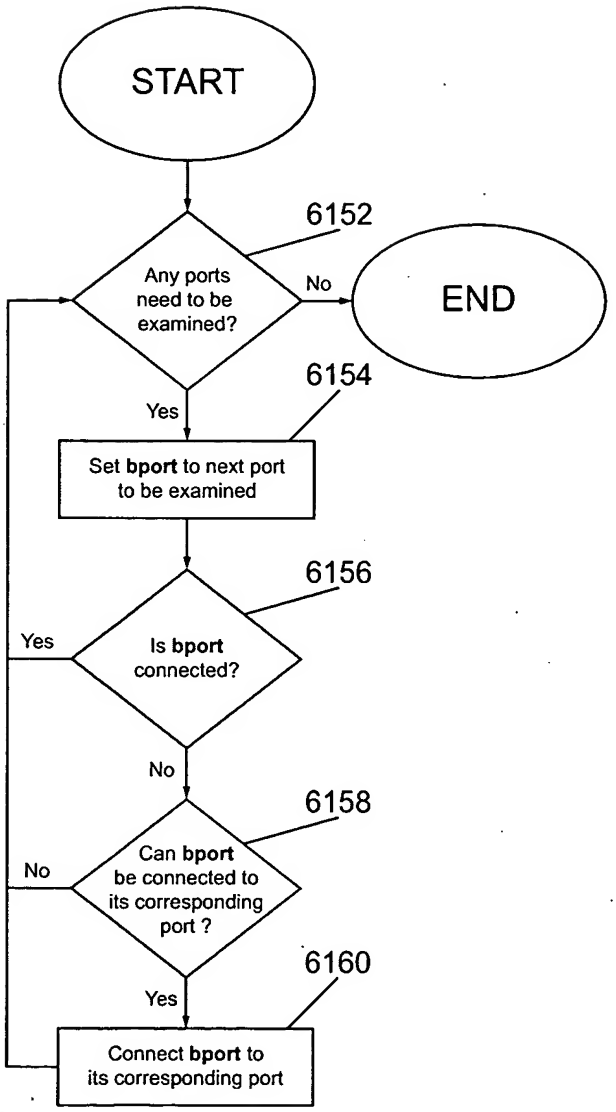

START
6152
Any ports need to be examined?
No
END
Yes
6154
Set bport to next port to be examined
6156
Is bport connected?
Yes
No
6158
Can bport be connected to its corresponding port ?
No
Yes
6160
Connect bport to its corresponding port

FIG. 43

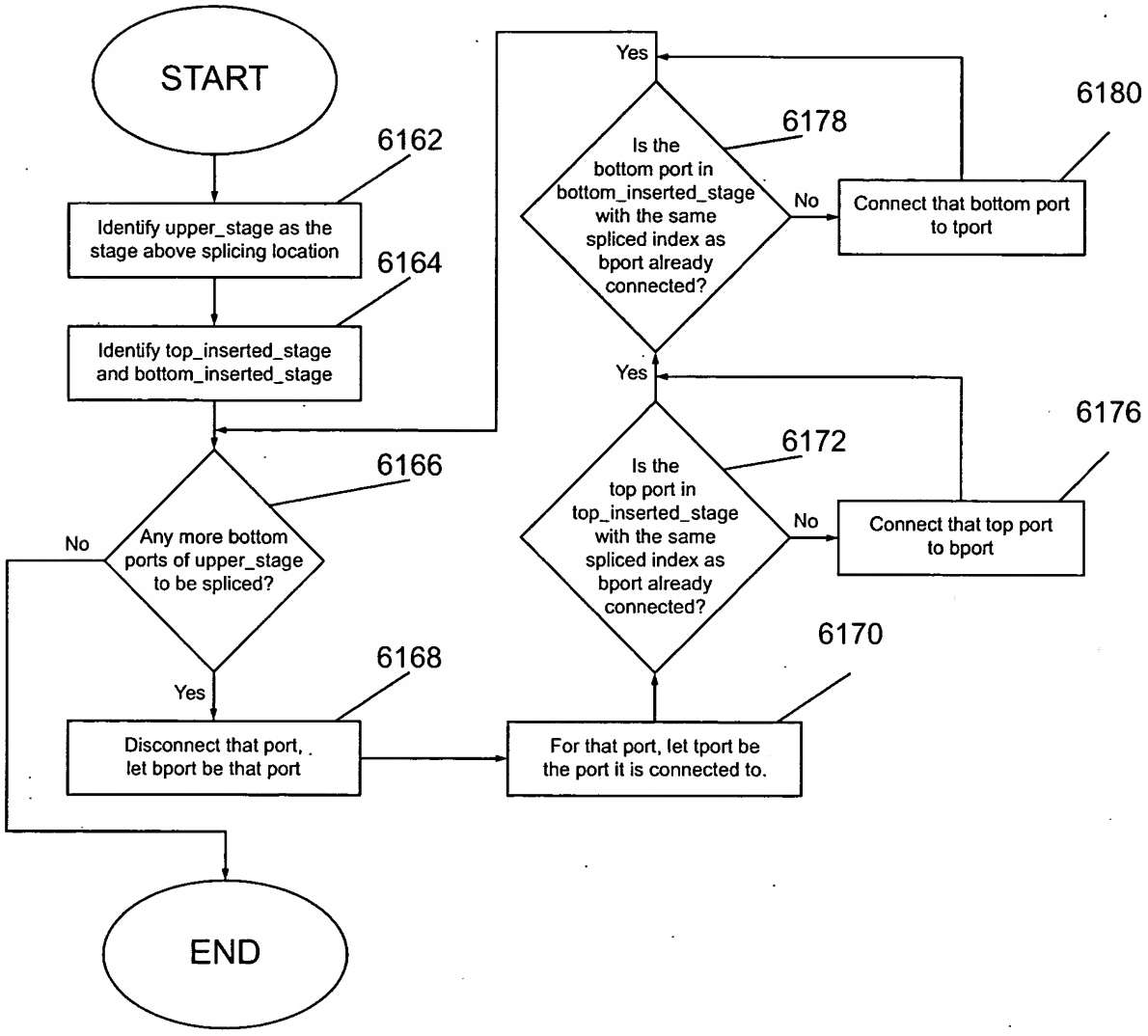

START
6162
Identify upper_stage as the stage above splicing location
6164
Identify top_inserted_stage and bottom_inserted_stage
6166
Any more bottom ports of upper_stage to be spliced?
No
Yes
6168
Disconnect that port, let bport be that port
END
6170
For that port, let tport be the port it is connected to.
6172
Is the top port in top_inserted_stage with the same spliced index as bport already connected?
No
Yes
6176
Connect that top port to bport
6178
Is the bottom port in bottom_inserted_stage with the same spliced index as bport already connected?
No
Yes
6180
Connect that bottom port to tport

FIG. 44

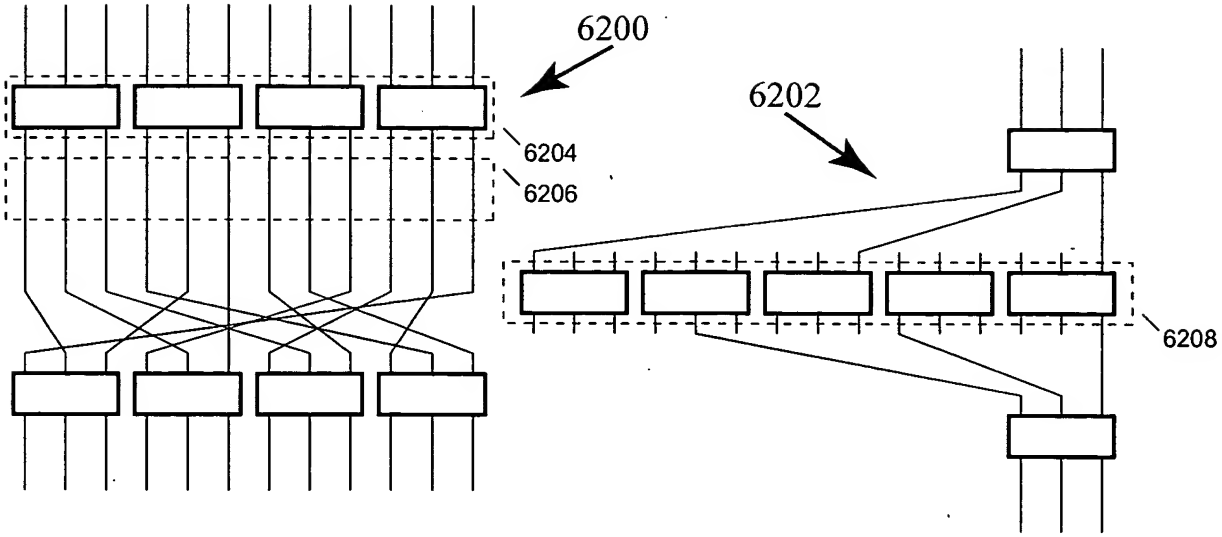


FIG. 45A

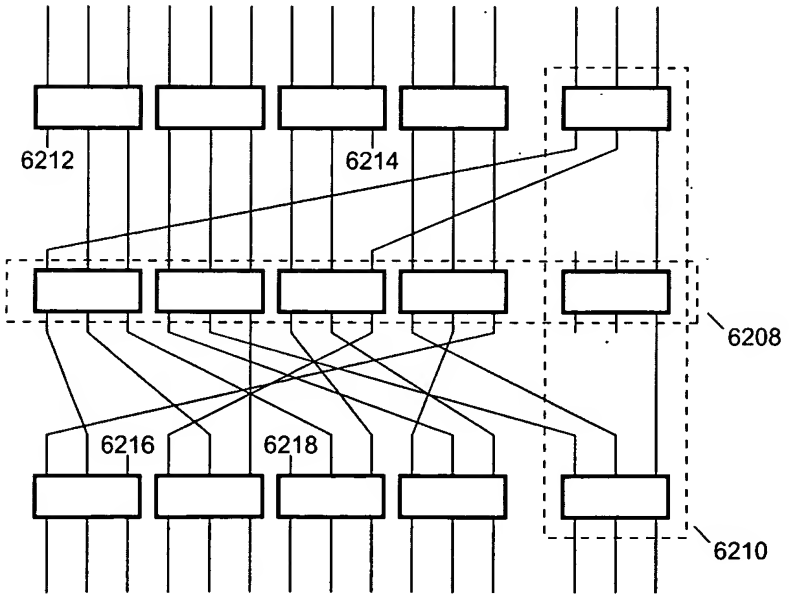


FIG. 45B

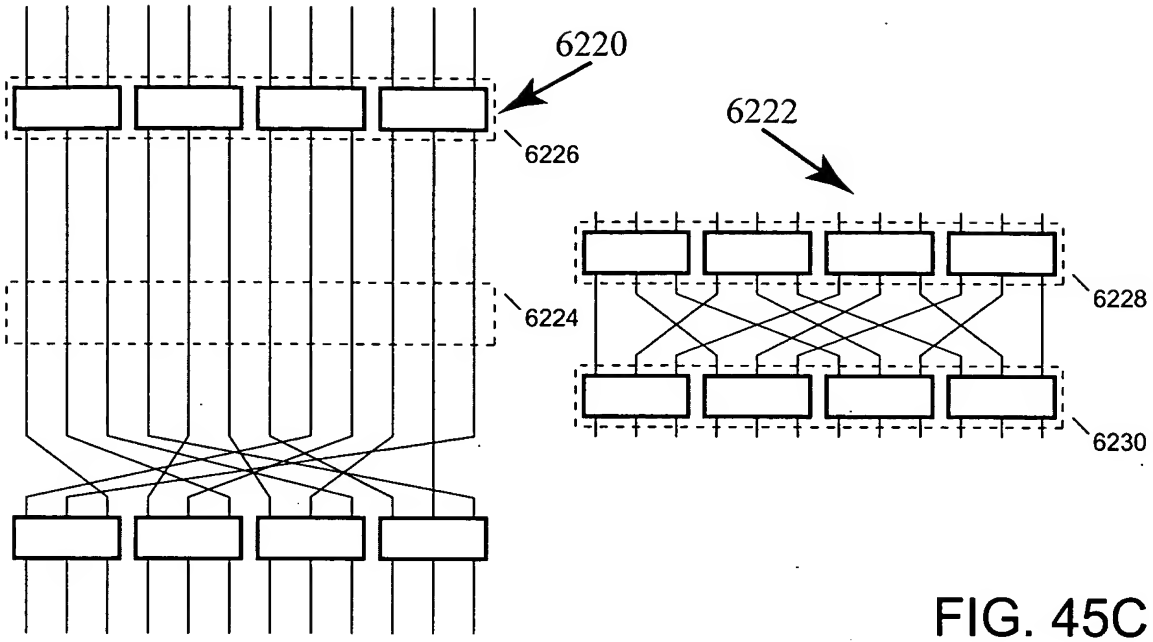


FIG. 45C

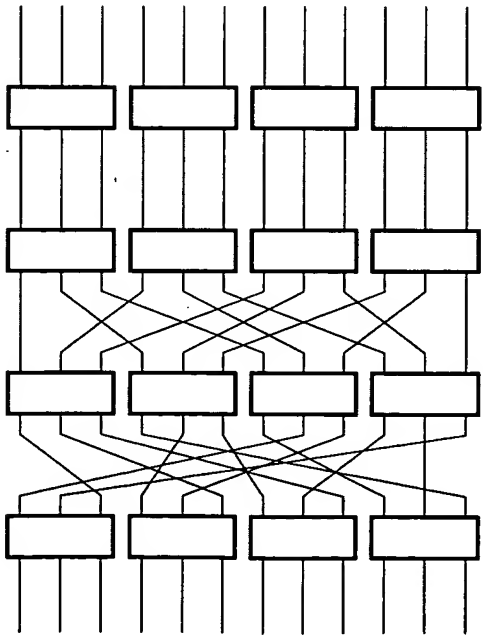


FIG. 45D

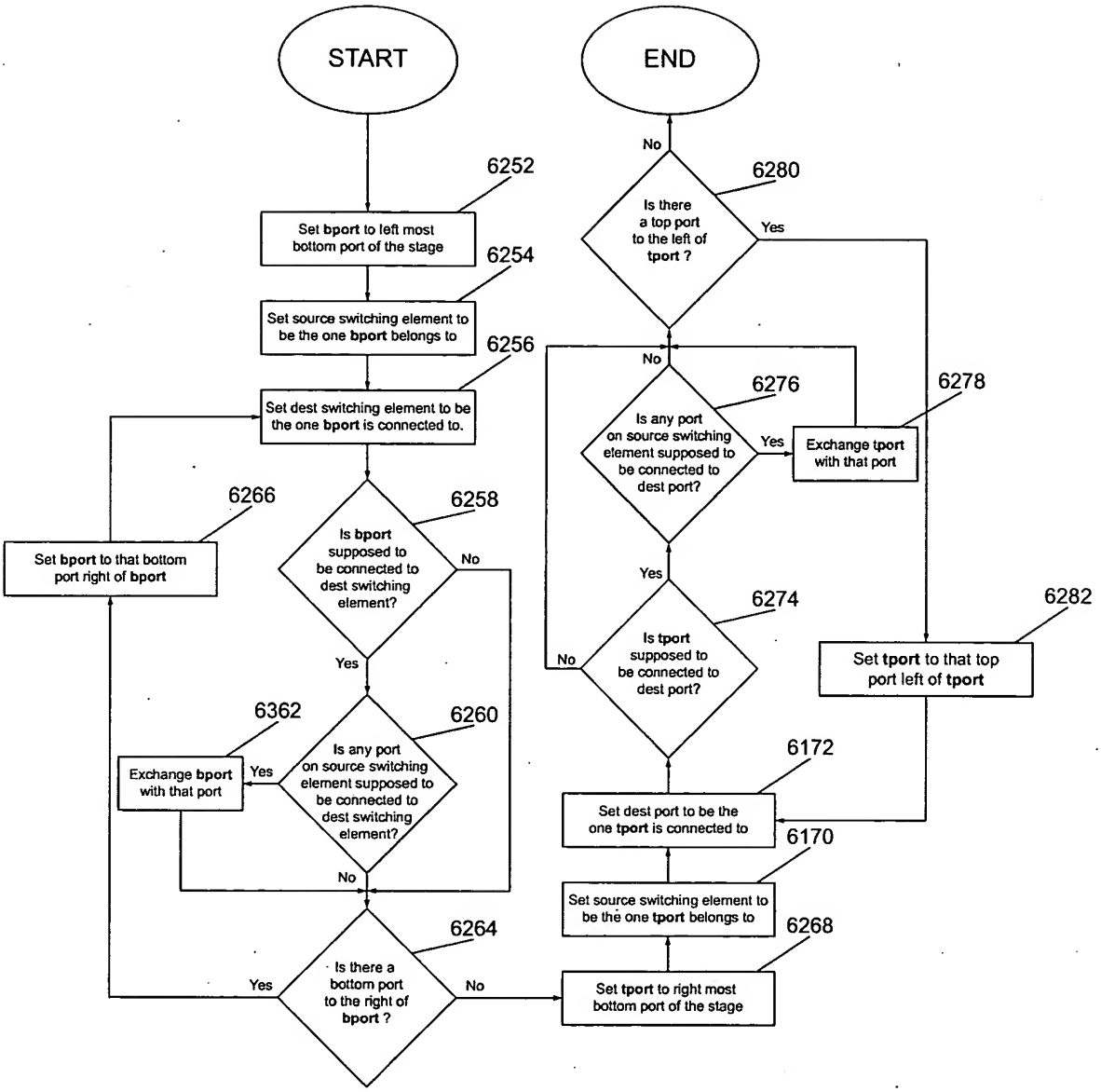

START
END
6252
Set bport to left most bottom port of the stage
6254
Set source switching element to be the one bport belongs to
6256
Set dest switching element to be the one bport is connected to.
6258
Is bport supposed to be connected to dest switching element?
No
Yes
6266
Set bport to that bottom port right of bport
6362
Exchange bport with that port
Yes
6260
Is any port on source switching element supposed to be connected to dest switching element?
No
6264
Is there a bottom port to the right of bport ?
Yes
No
Set tport to right most bottom port of the stage
6268
Set source switching element to be the one tport belongs to
6170
Set dest port to be the one tport is connected to
6172
6274
Is tport supposed to be connected to dest port?
No
Yes
6276
Is any port on source switching element supposed to be connected to dest port?
Yes
Exchange tport with that port
6278
No
6280
Is there a top port to the left of tport ?
Yes
No
6282
Set tport to that top port left of tport

FIG. 46

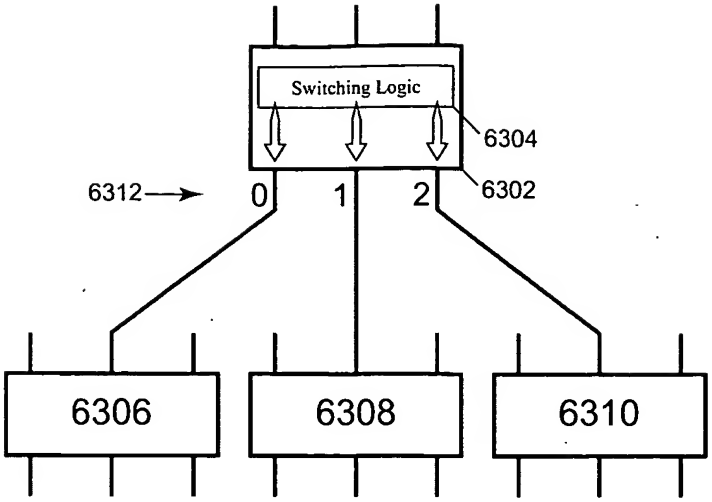


FIG. 47A

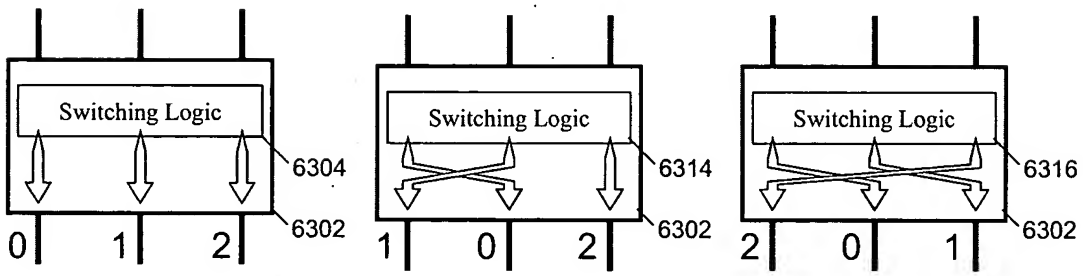


FIG. 47B

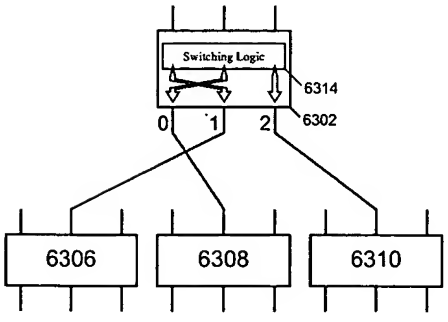


FIG. 47C

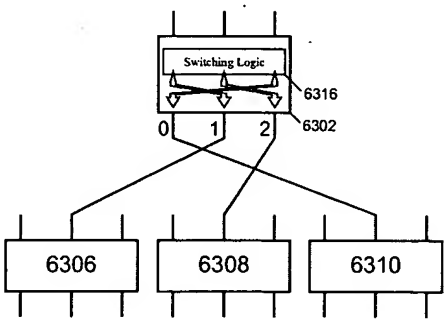


FIG. 47D

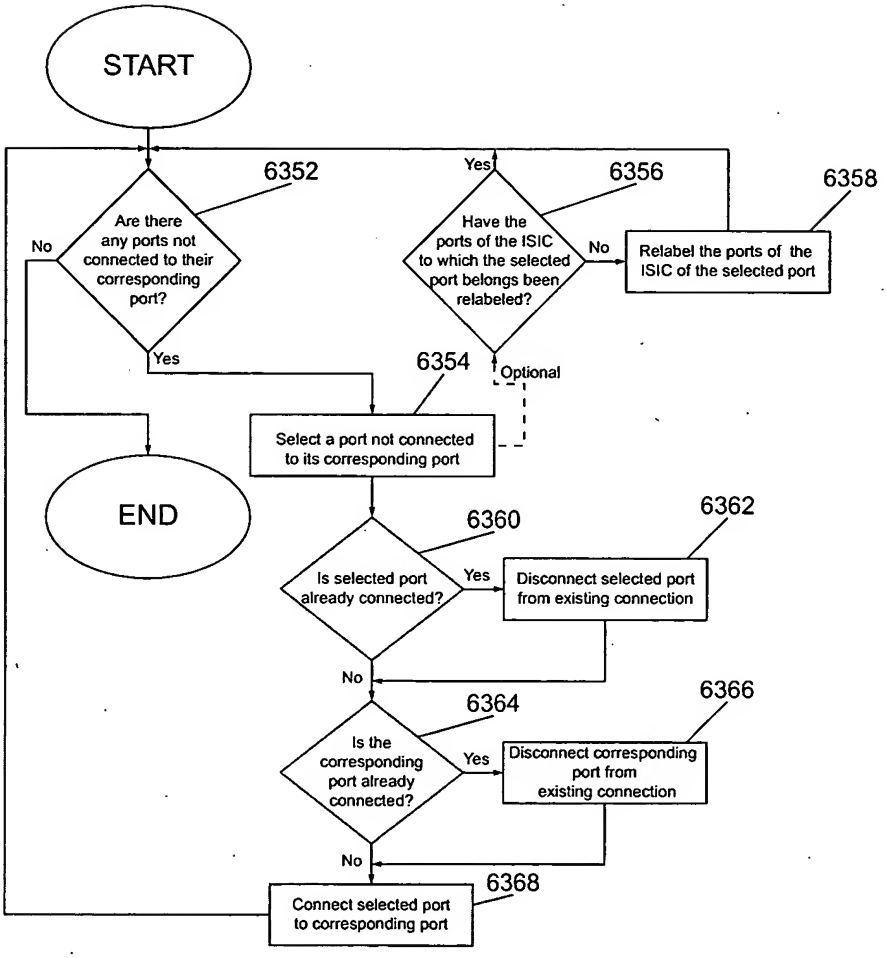

START
6352
Are there any ports not connected to their corresponding port?
No
Yes
6356
Have the ports of the ISIC to which the selected port belongs been relabeled?
Yes
No
6358
Relabel the ports of the ISIC of the selected port
6354
Optional
Select a port not connected to its corresponding port
END
6360
Is selected port already connected?
Yes
6362
Disconnect selected port from existing connection
No
6364
Is the corresponding port already connected?
Yes
6366
Disconnect corresponding port from existing connection
No
6368
Connect selected port to corresponding port

FIG. 48A

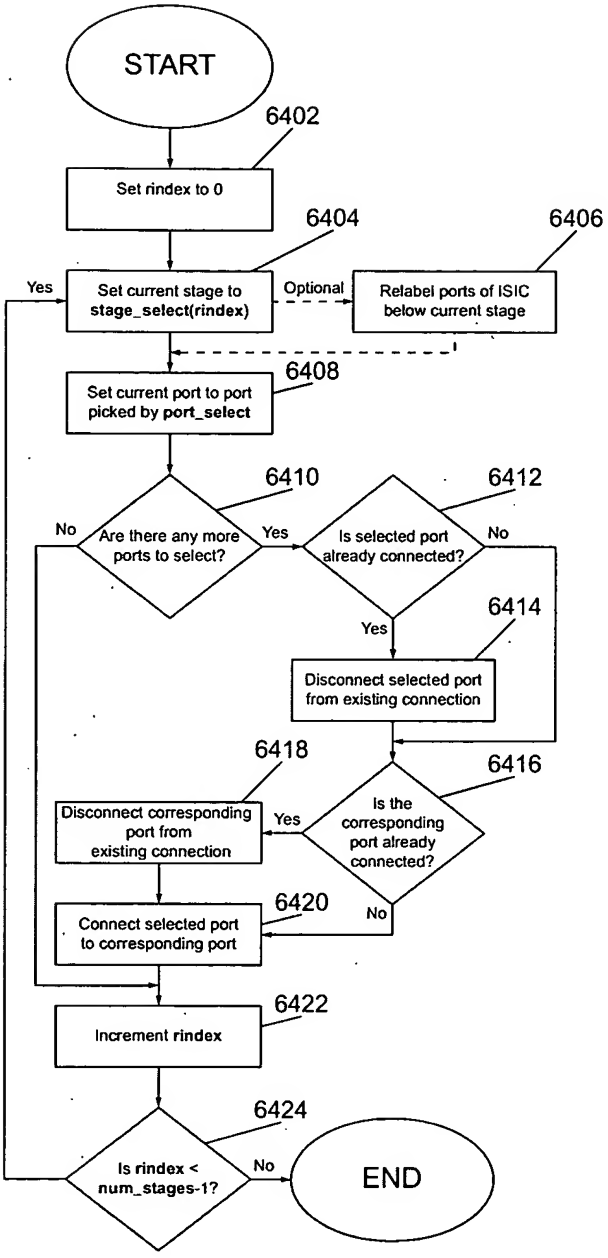

START
6402
Set rindex to 0
6404
6406
Yes
Set current stage to stage_select(rindex)
Optional
Relabel ports of ISIC below current stage
6408
Set current port to port picked by port_select
6410
6412
No
Are there any more ports to select?
Yes
Is selected port already connected?
No
Yes
6414
Disconnect selected port from existing connection
6418
6416
Disconnect corresponding port from existing connection
Yes
Is the corresponding port already connected?
6420
No
Connect selected port to corresponding port
6422
Increment rindex
6424
Is rindex < num_stages-1?
No
END

FIG. 48B

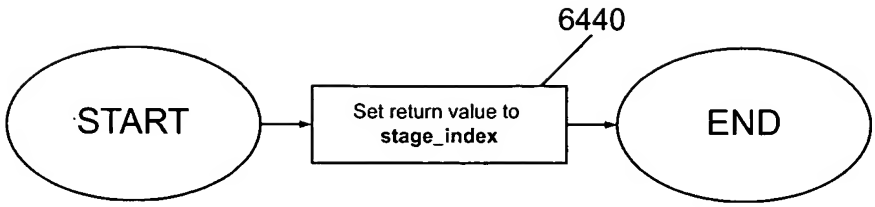


FIG. 49A

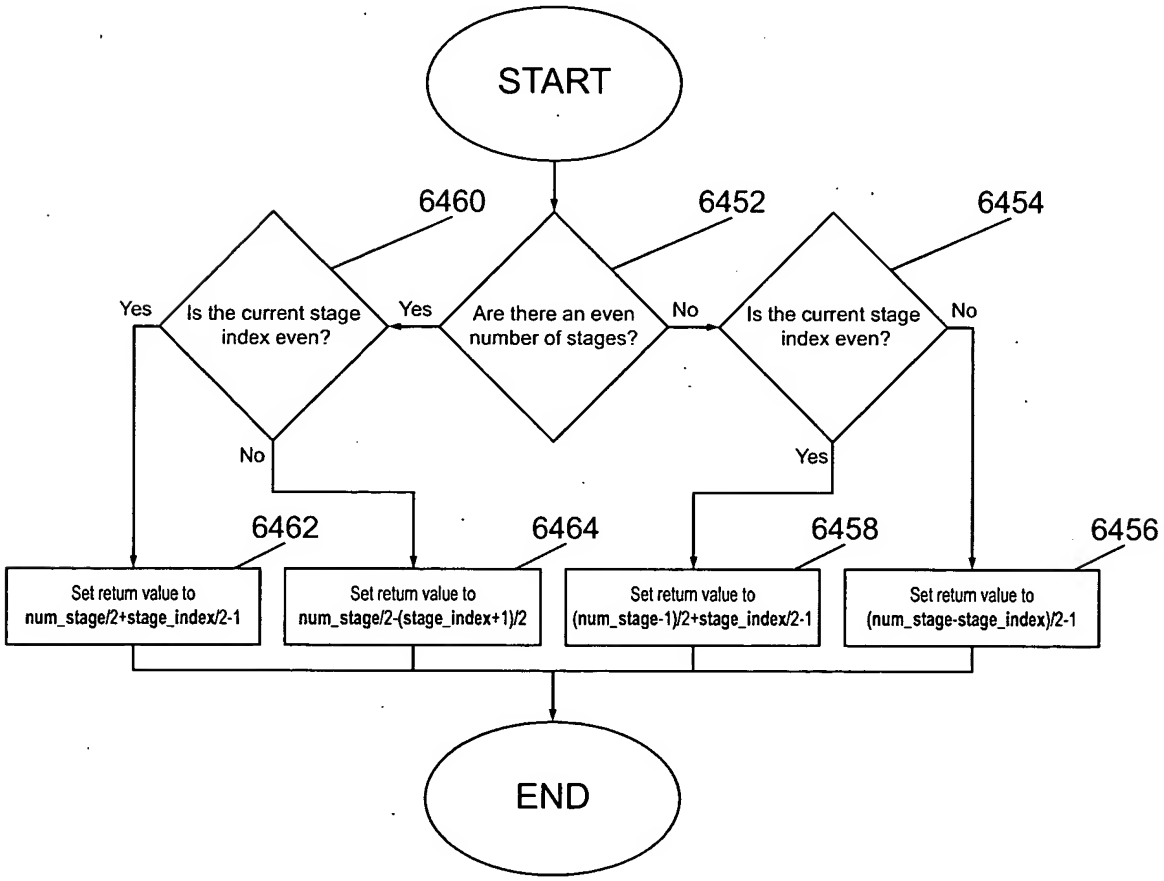


FIG. 49B

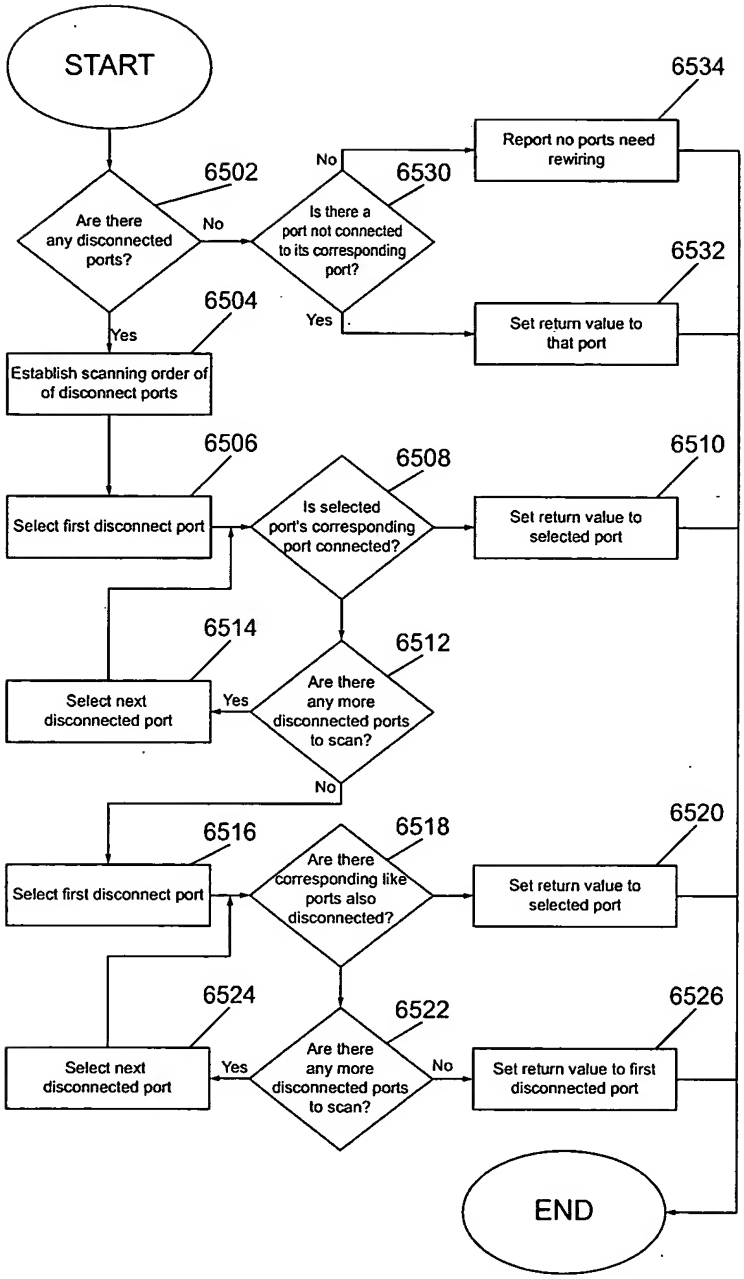

START
6502
Are there any disconnected ports?
No
6530
Is there a port not connected to its corresponding port?
No
6534
Report no ports need rewiring
Yes
6532
Set return value to that port
Yes
6504
Establish scanning order of of disconnect ports
6506
Select first disconnect port
6508
Is selected port's corresponding port connected?
6510
Set return value to selected port
6514
Select next disconnected port
Yes
6512
Are there any more disconnected ports to scan?
No
6516
Select first disconnect port
6518
Are there corresponding like ports also disconnected?
6520
Set return value to selected port
6524
Select next disconnected port
Yes
6522
Are there any more disconnected ports to scan?
No
6526
Set return value to first disconnected port
END

FIG. 50A

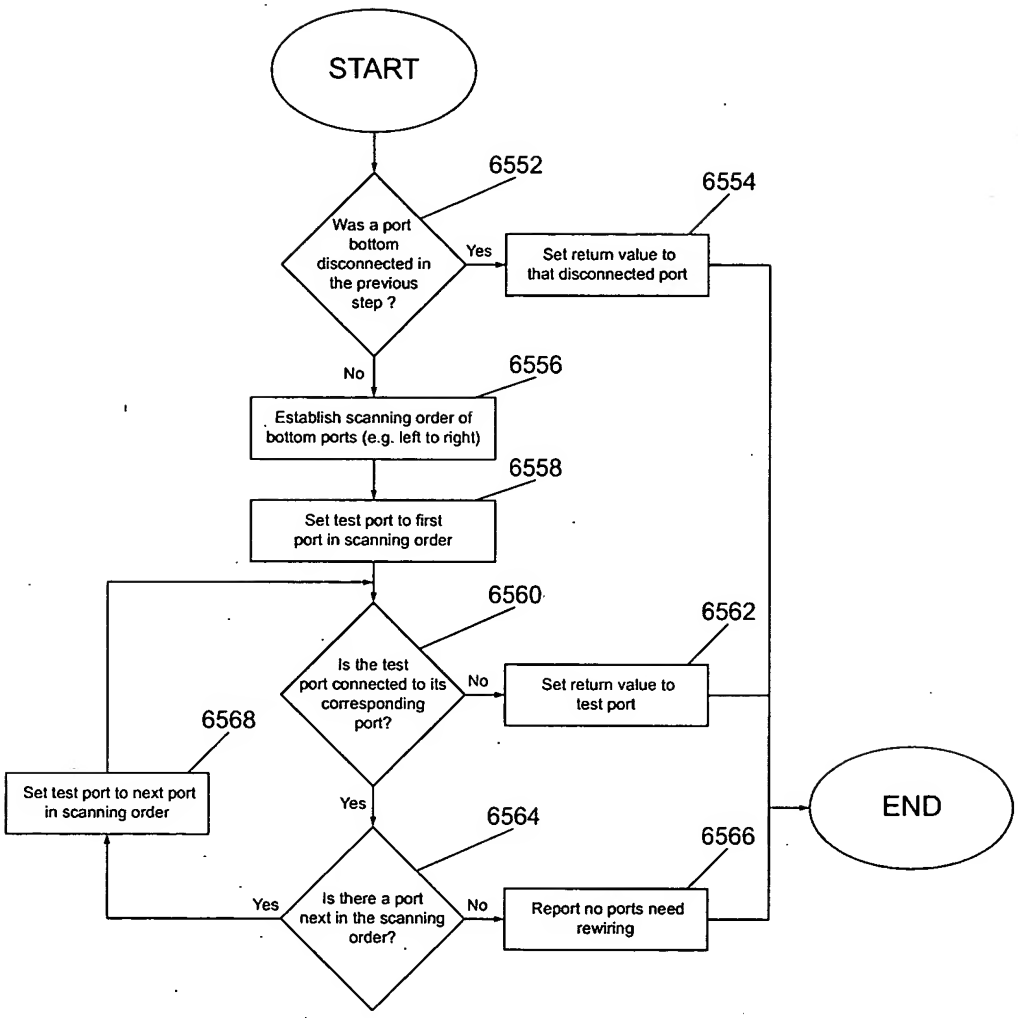

START
6552
Was a port bottom disconnected in the previous step ?
Yes
6554
Set return value to that disconnected port
No
6556
Establish scanning order of bottom ports (e.g. left to right)
6558
Set test port to first port in scanning order
6560
Is the test port connected to its corresponding port?
No
6562
Set return value to test port
Yes
6564
Is there a port next in the scanning order?
Yes
6568
Set test port to next port in scanning order
No
6566
Report no ports need rewiring
END

FIG. 50B

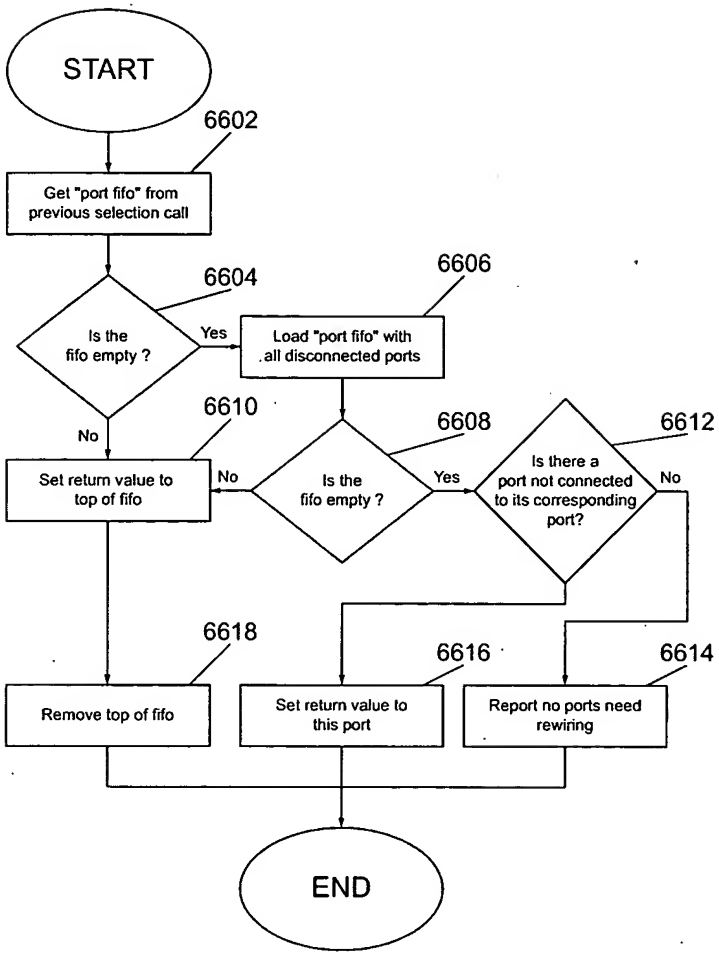

START
6602
Get "port fifo" from previous selection call
6604
Is the fifo empty ?
Yes
6606
Load "port fifo" with all disconnected ports
No
6610
Set return value to top of fifo
No
6608
Is the fifo empty ?
Yes
6612
Is there a port not connected to its corresponding port?
No
6618
Remove top of fifo
6616
Set return value to this port
6614
Report no ports need rewiring
END

FIG. 50C

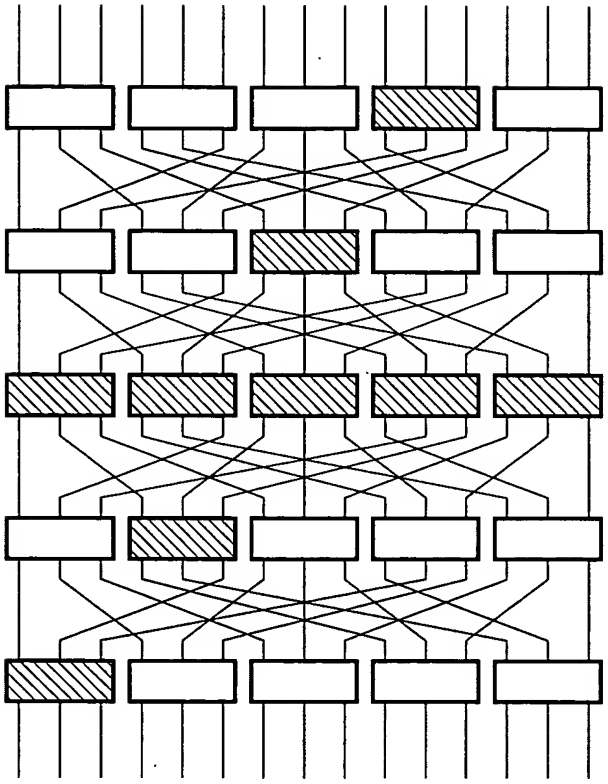


FIG. 51A

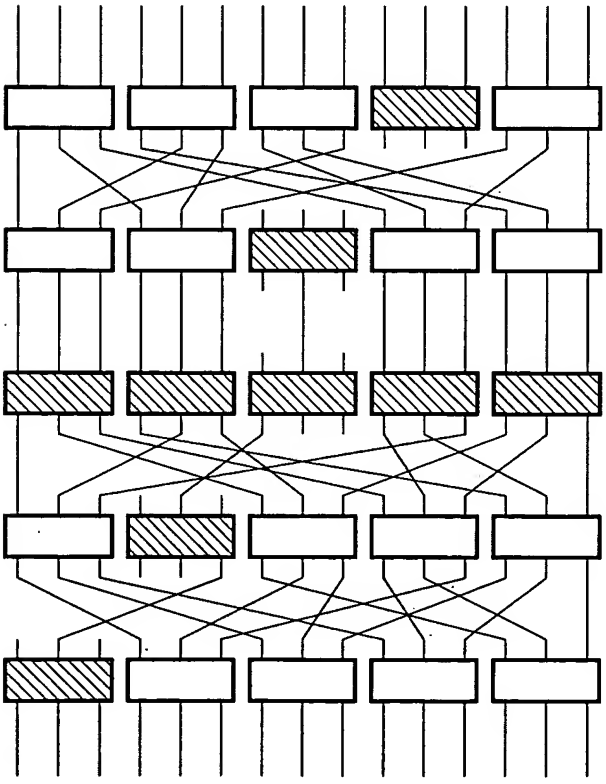
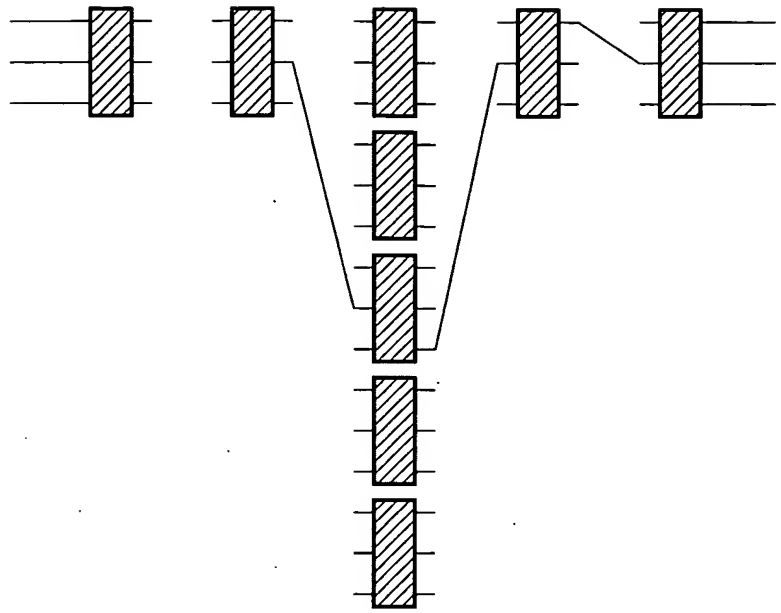


FIG. 51B



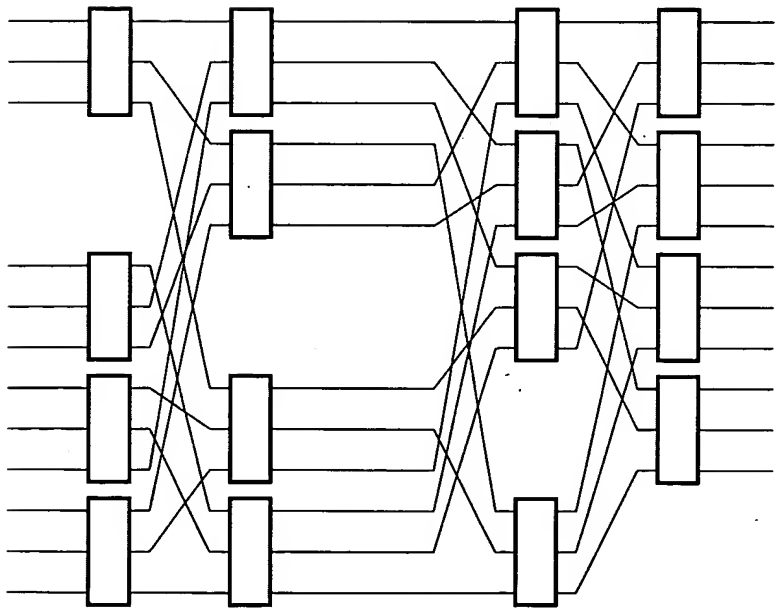


FIG. 51C

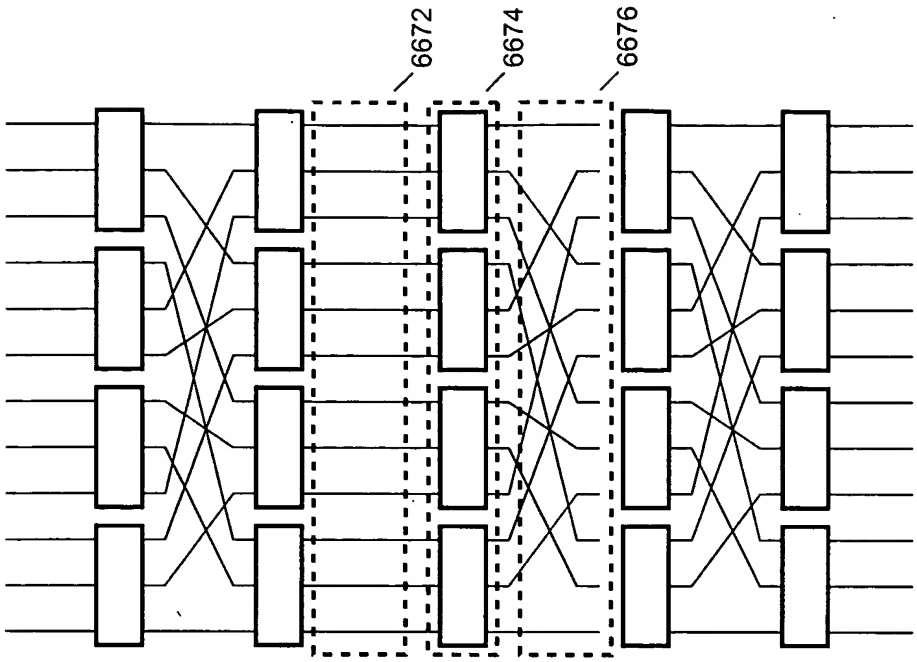


FIG. 52B

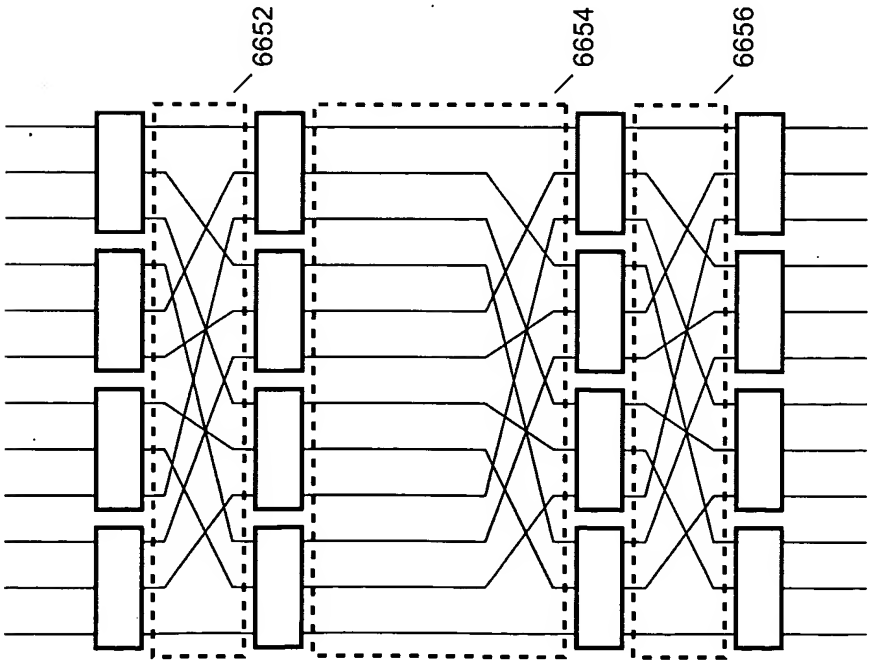


FIG. 52A

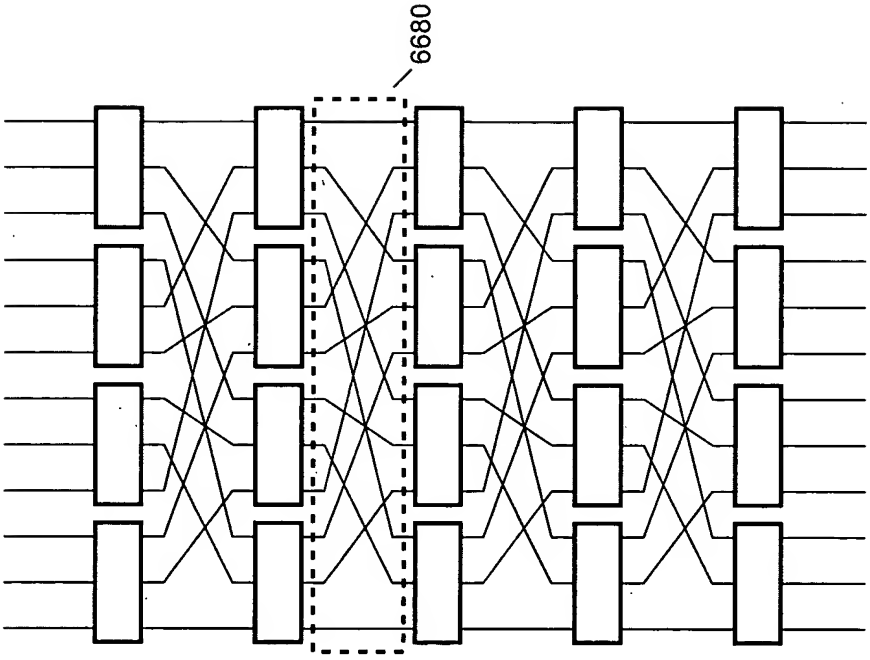
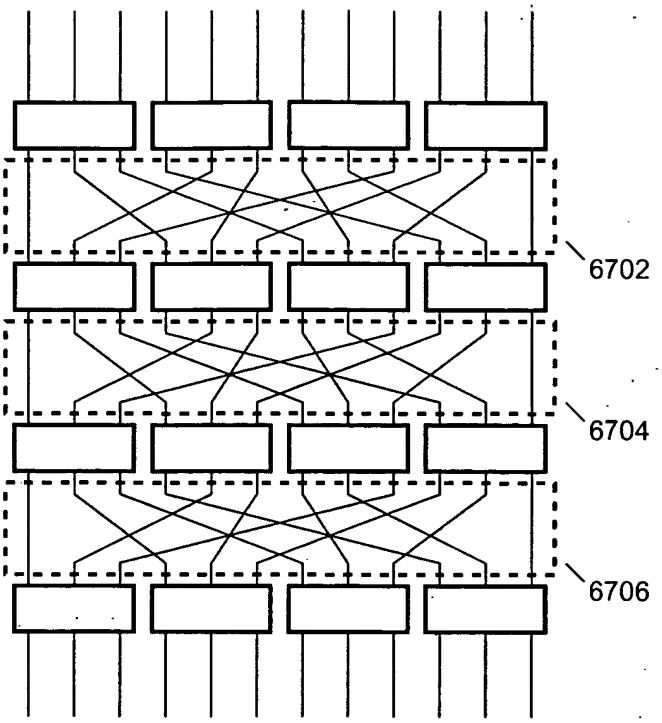


FIG. 52C

FIG. 53A



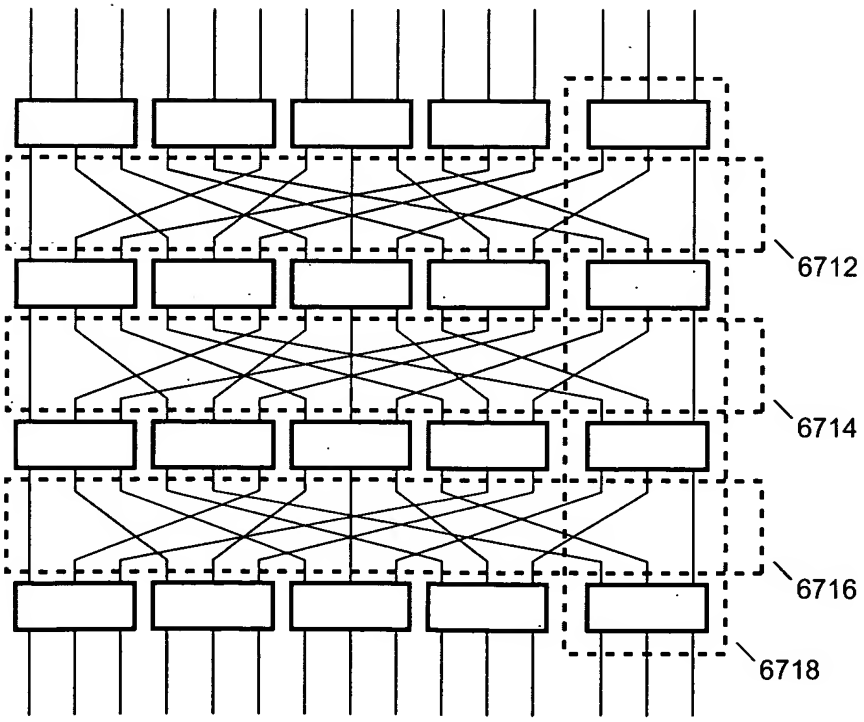
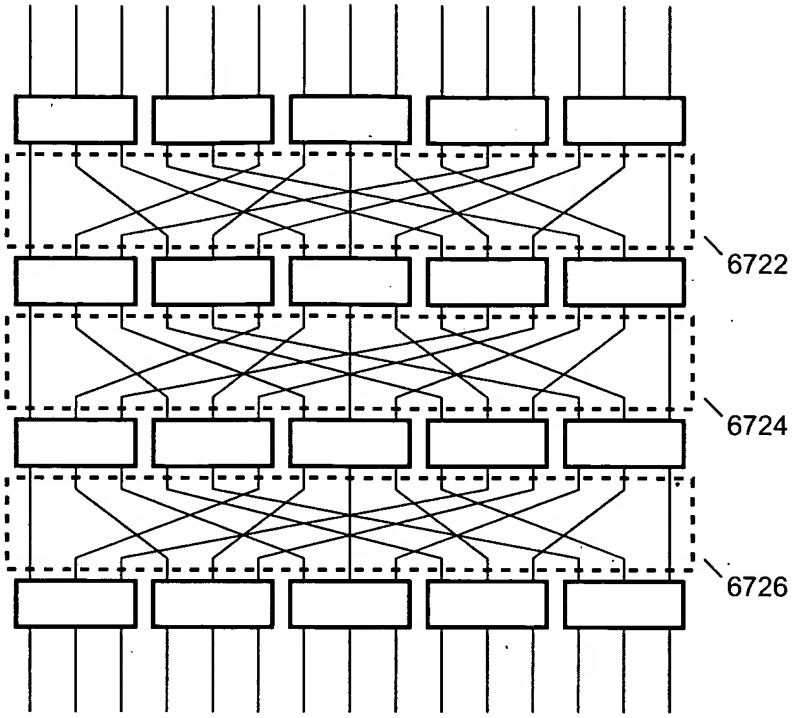


FIG. 53B

FIG. 54A



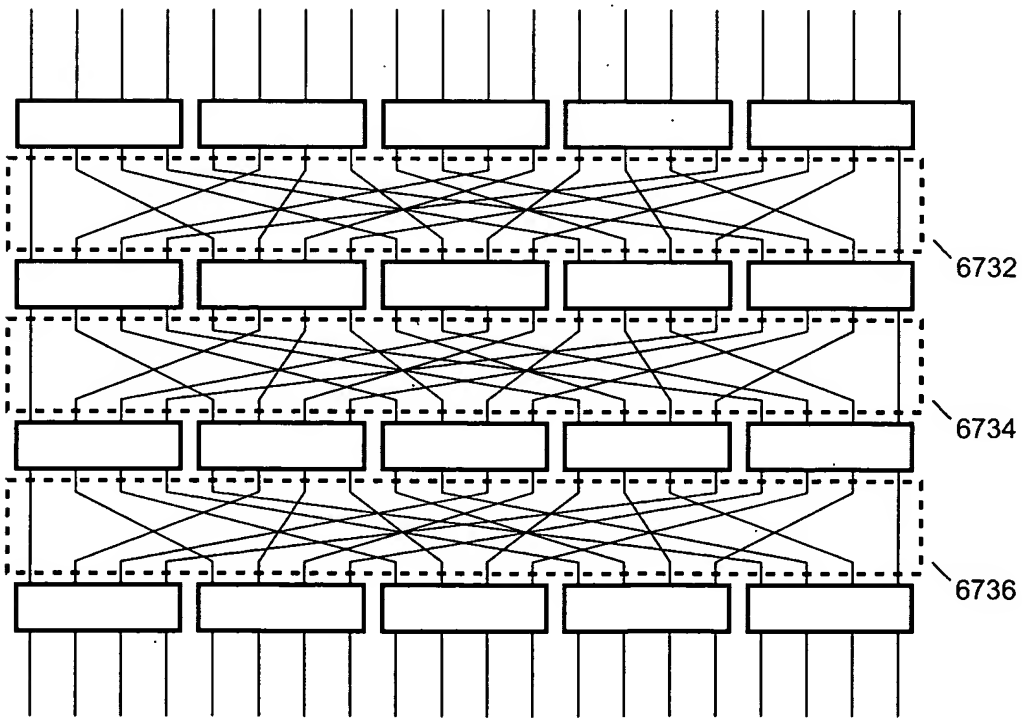
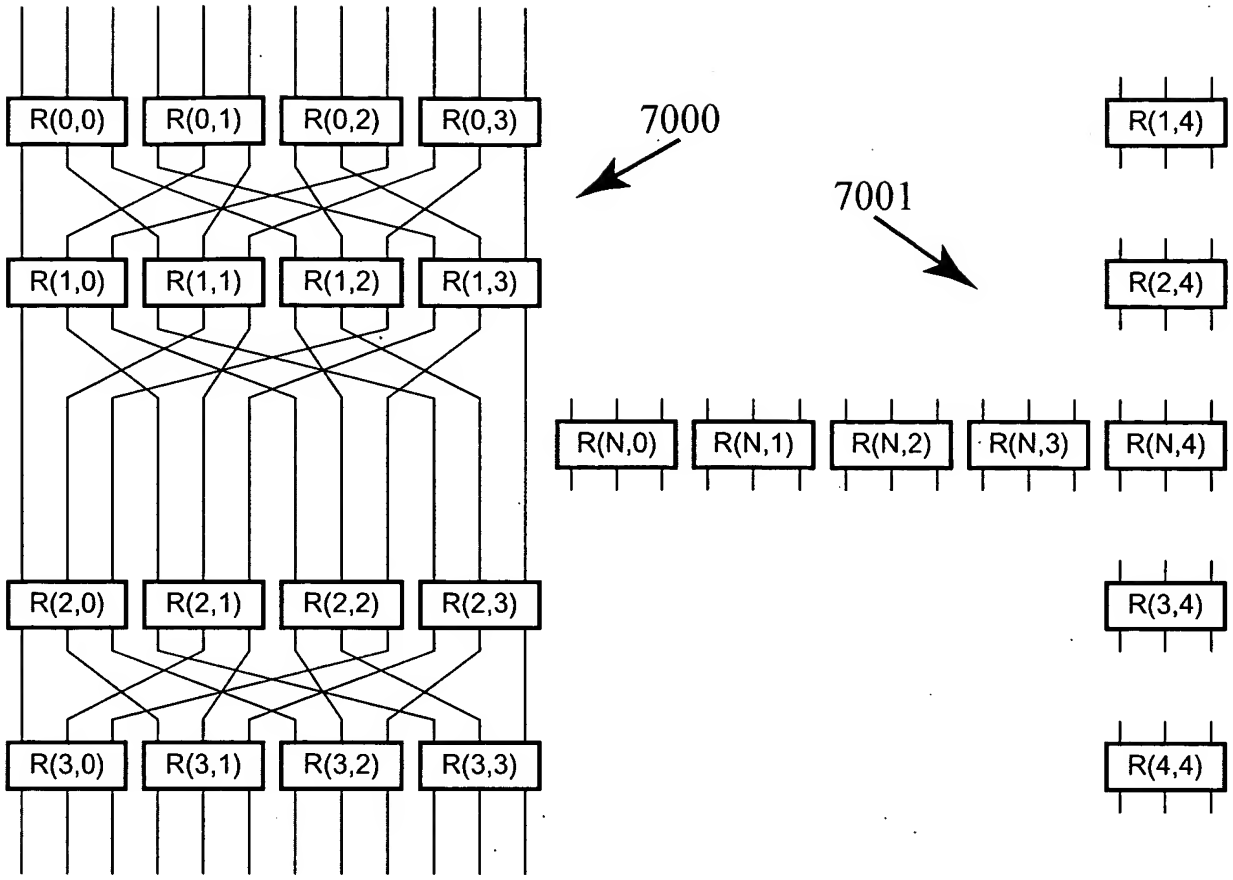


FIG. 54B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R(0,1)
R(0,2)
R(0,3)
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R(1,4)
7001
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R(1,2)
R(1,3)
R(2,4)
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R(N,1)
R(N,2)
R(N,3)
R(N,4)
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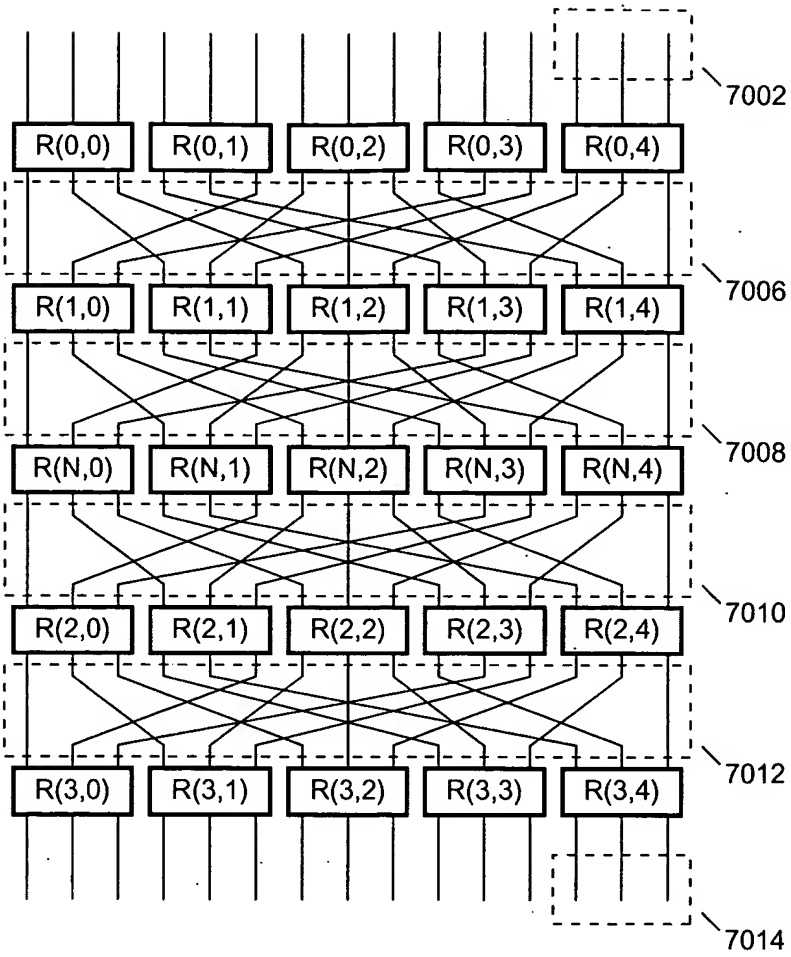
R(2,1)
R(2,2)
R(2,3)
R(3,4)
R(3,0)
R(3,1)
R(3,2)
R(3,3)
R(4,4)

FIG. 55


R(0,0)
R(0,1)
R(0,2)
R(0,3)
R(0,4)
R(1,0)
R(1,1)
R(1,2)
R(1,3)
R(1,4)
R(N,0)
R(N,1)
R(N,2)
R(N,3)
R(N,4)
R(2,0)
R(2,1)
R(2,2)
R(2,3)
R(2,4)
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R(3,1)
R(3,2)
R(3,3)
R(3,4)
7002
7006
7008
7010
7012
7014

FIG. 56

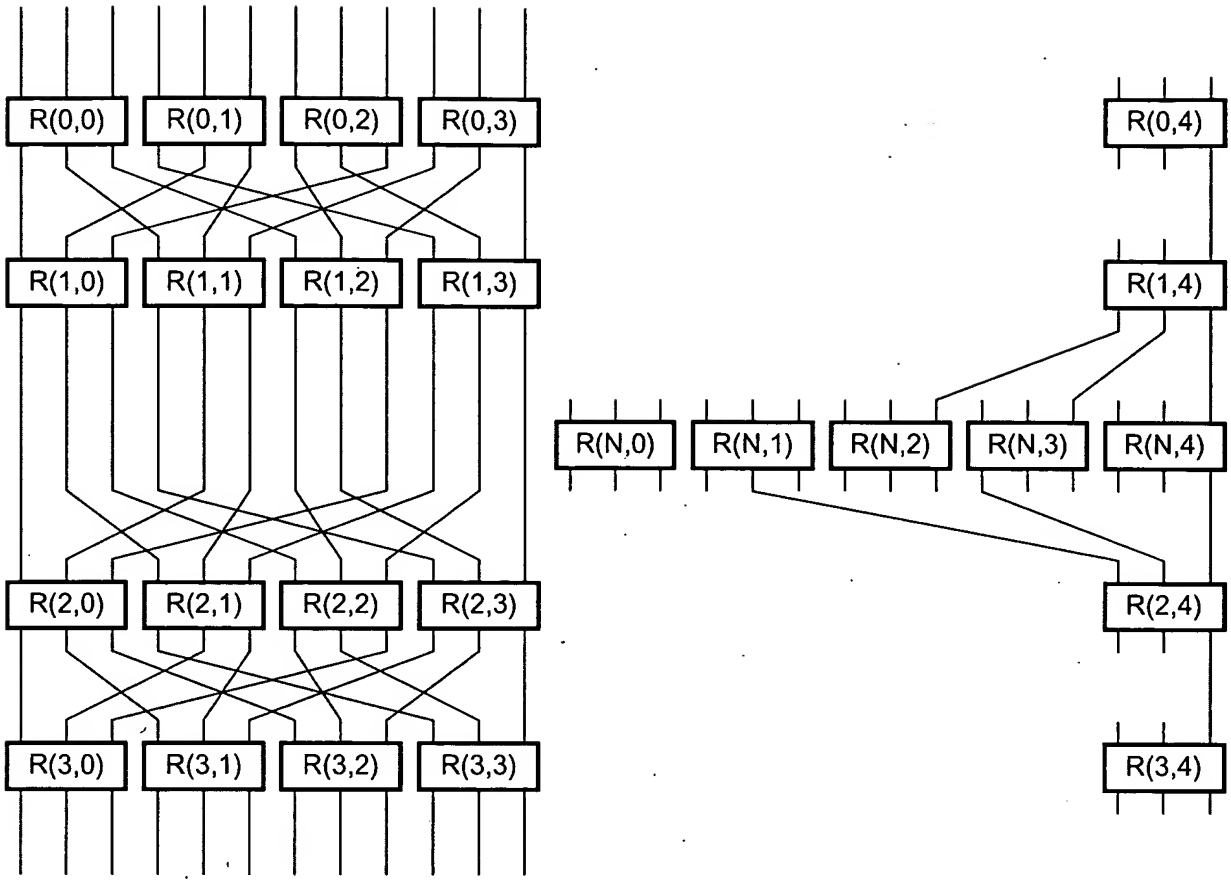


FIG. 57

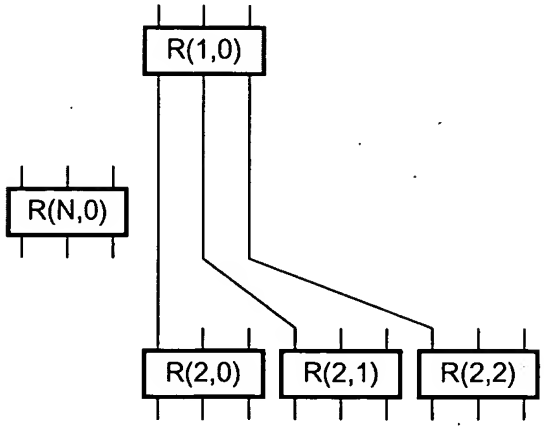
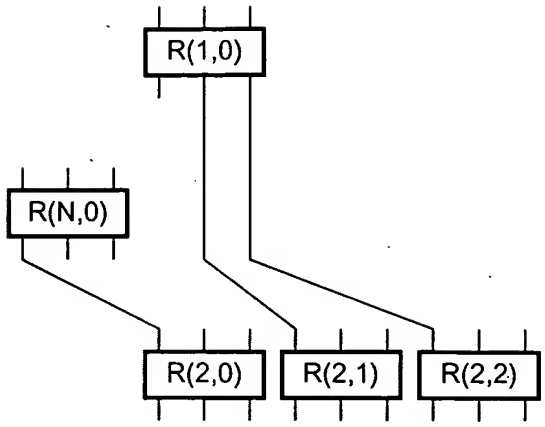


FIG. 58A

FIG. 58B



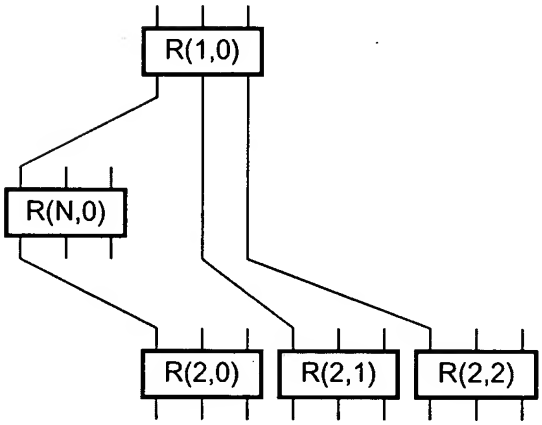
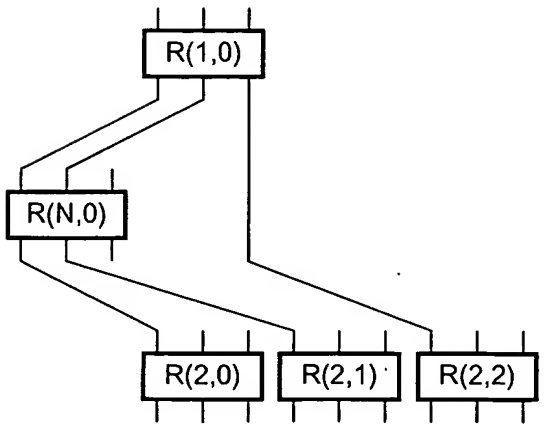


FIG. 58C

FIG. 58D



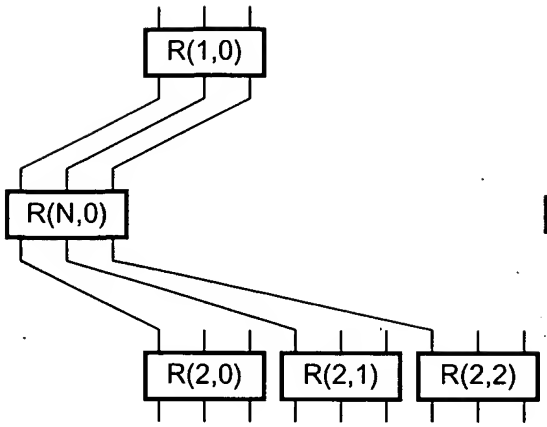


FIG. 58E

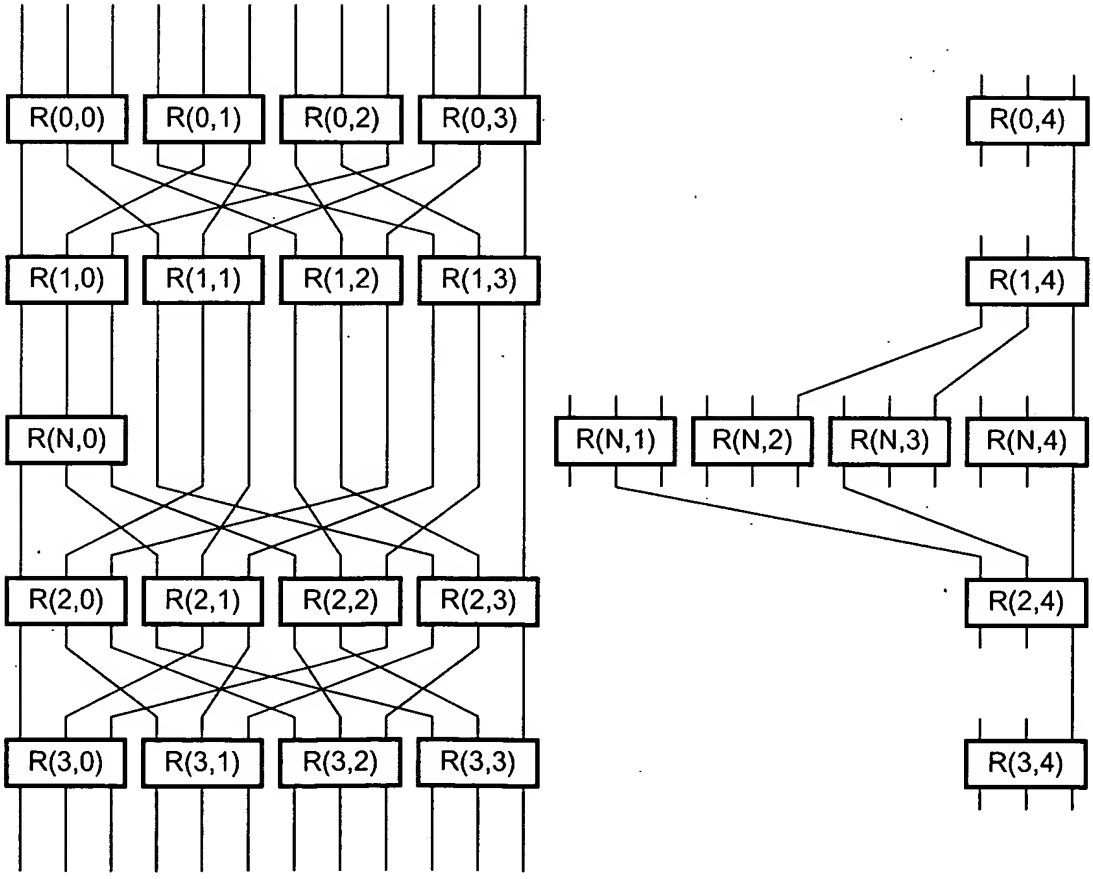


FIG. 58F

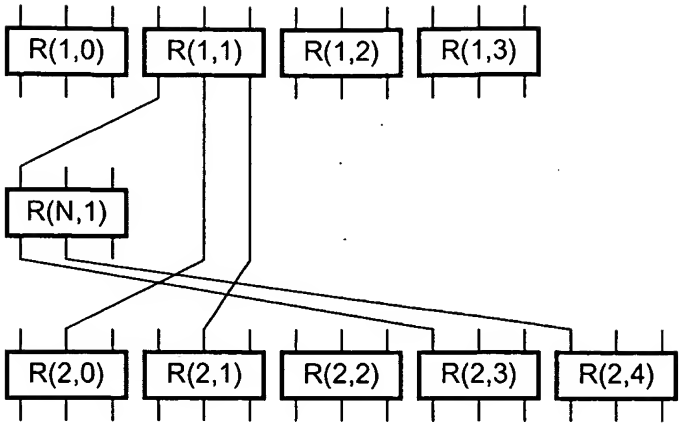


FIG. 58G

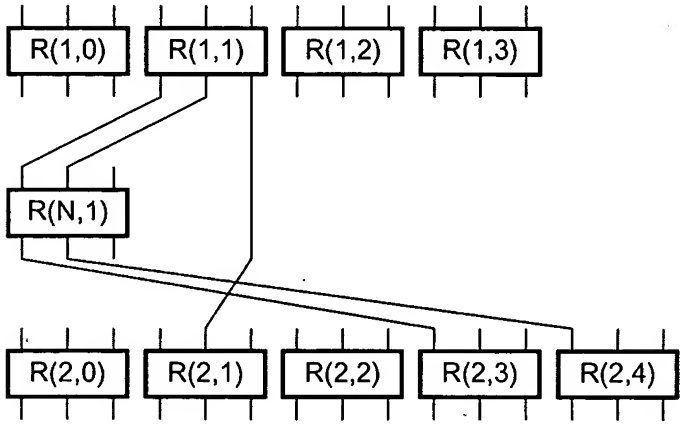


FIG. 58H

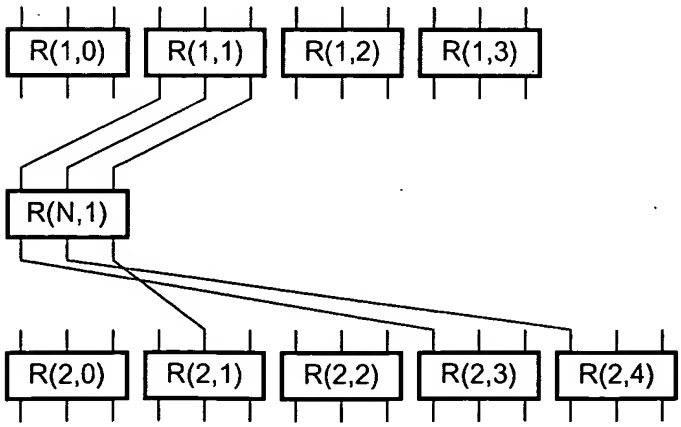


FIG. 58I

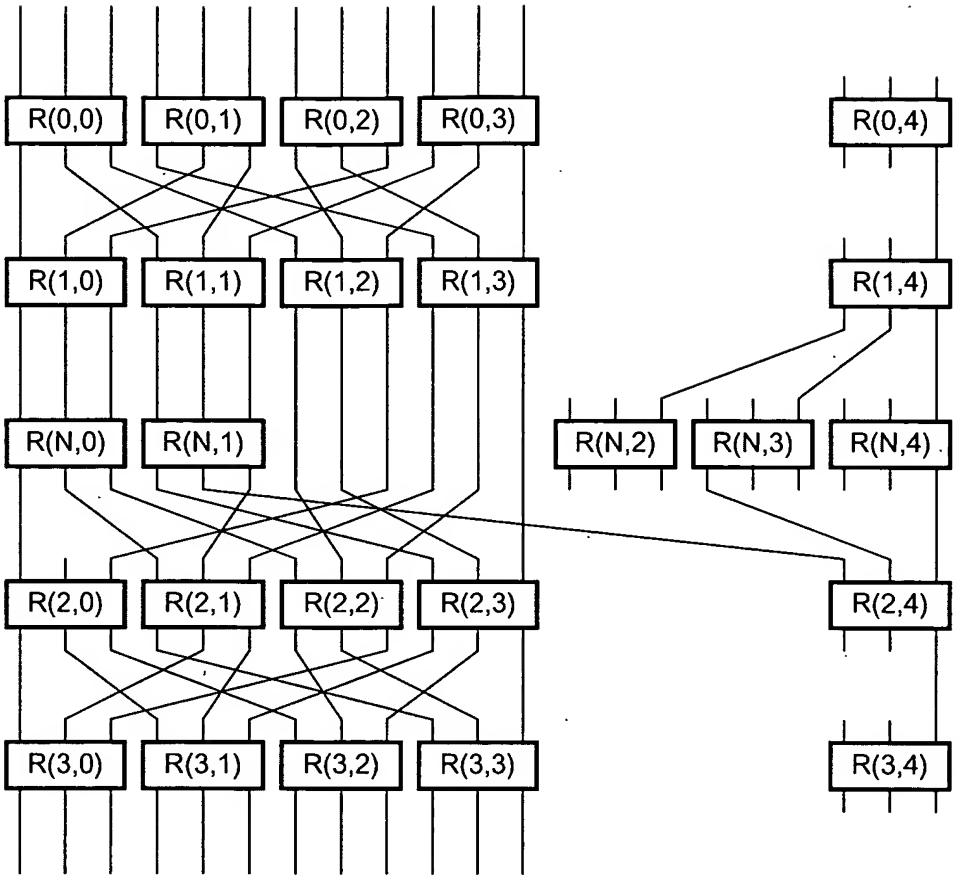

R(0,0)
R(0,1)
R(0,2)
R(0,3)
R(0,4)
R(1,0)
R(1,1)
R(1,2)
R(1,3)
R(1,4)
R(N,0)
R(N,1)
R(N,2)
R(N,3)
R(N,4)
R(2,0)
R(2,1)
R(2,2)
R(2,3)
R(2,4)
R(3,0)
R(3,1)
R(3,2)
R(3,3)
R(3,4)

FIG. 58J

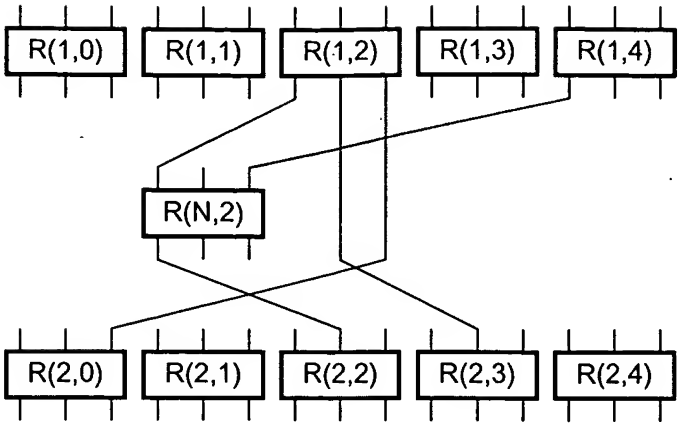


FIG. 58K

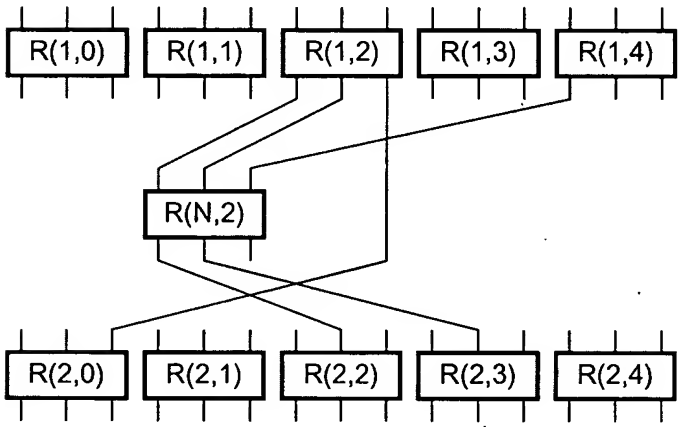


FIG. 58L

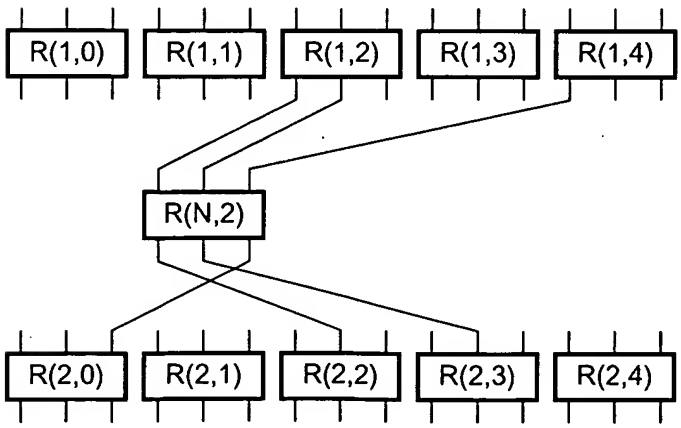
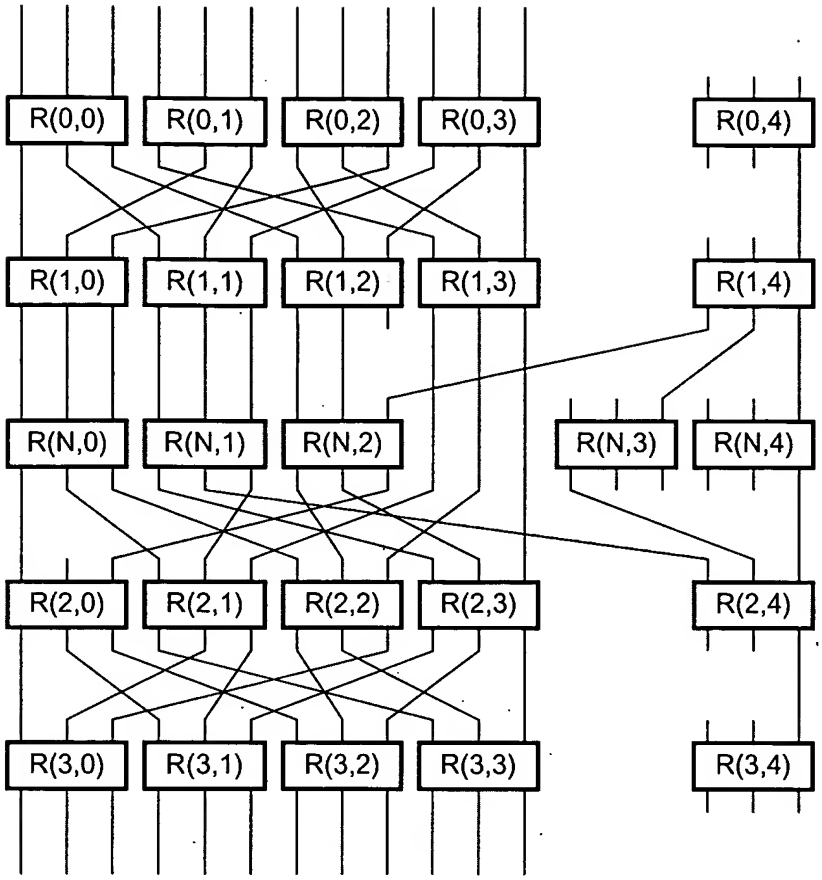


FIG. 58M


R(0,0)
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R(0,2)
R(0,3)
R(0,4)
R(1,0)
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R(1,2)
R(1,3)
R(1,4)
R(N,0)
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R(N,2)
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R(2,2)
R(2,3)
R(2,4)
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R(3,1)
R(3,2)
R(3,3)
R(3,4)

FIG. 58N

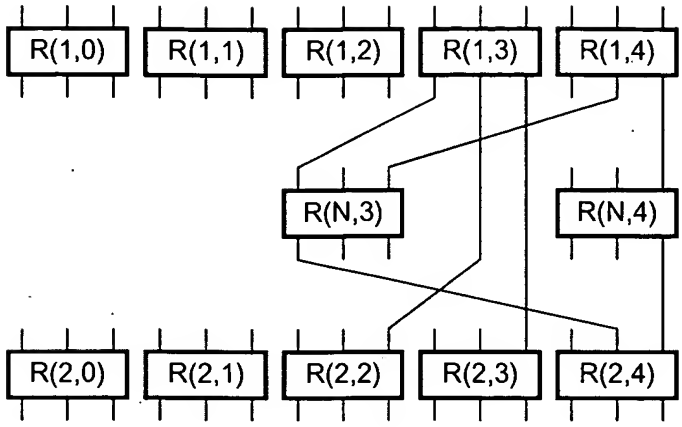


FIG. 58O

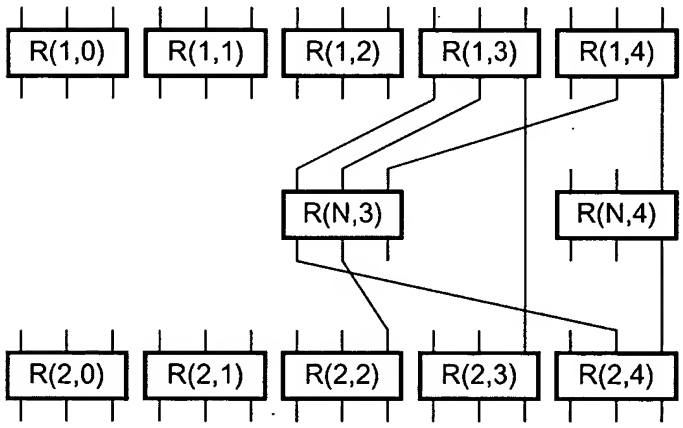


FIG. 58P

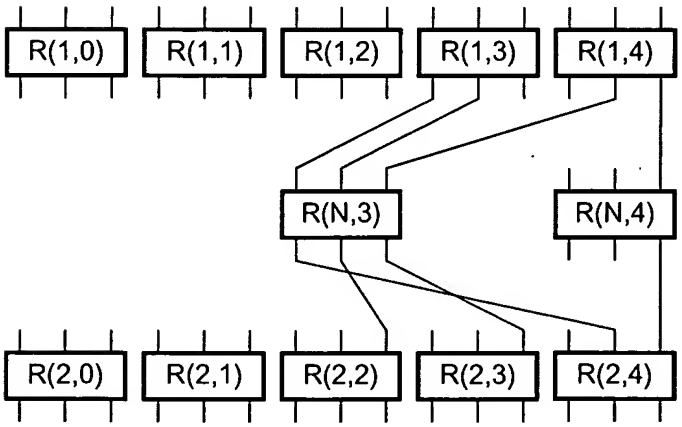


FIG. 58Q

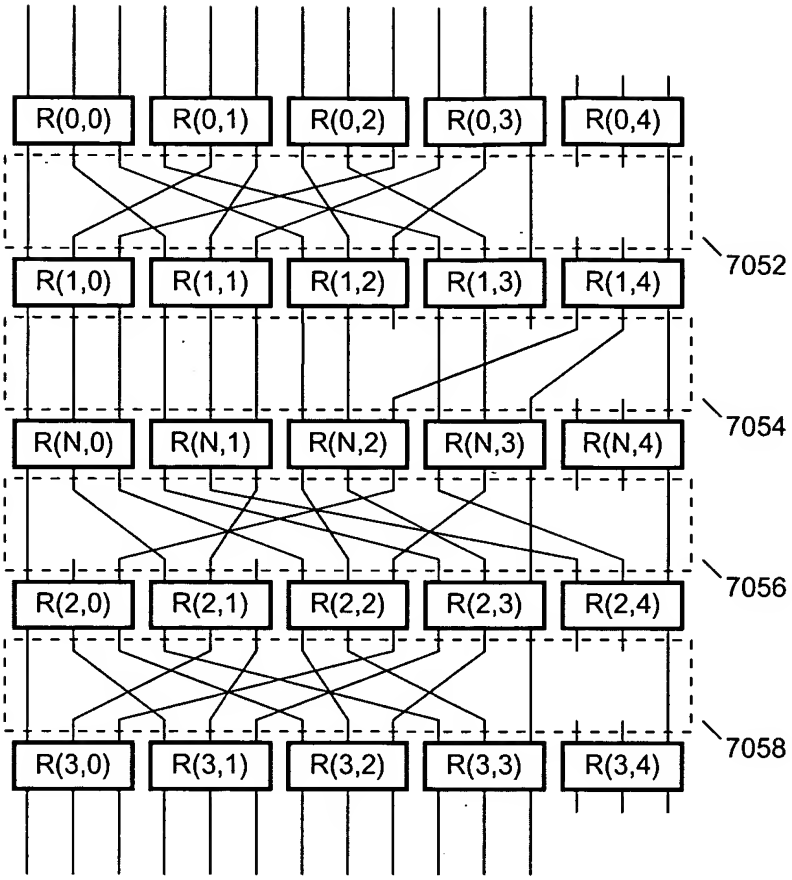


FIG. 58R

FIG. 59A

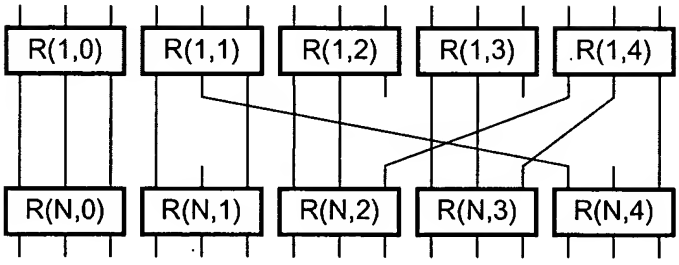


FIG. 59B

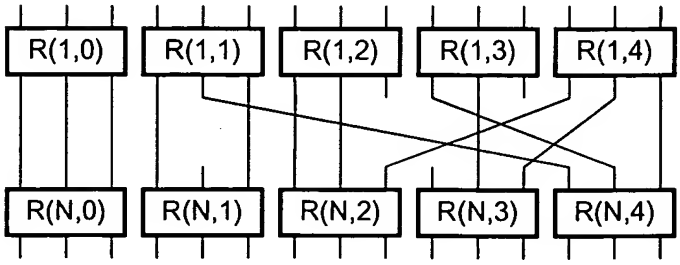


FIG. 59C

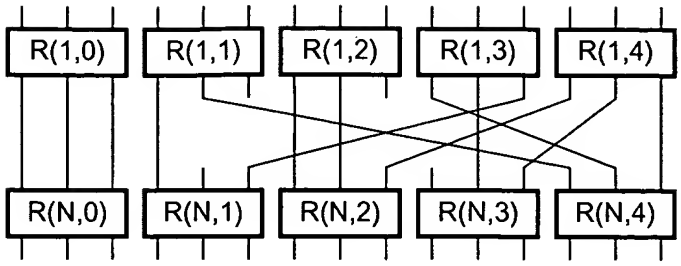


FIG. 59D

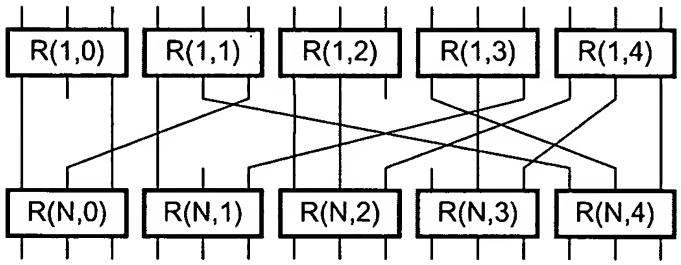


FIG. 59E

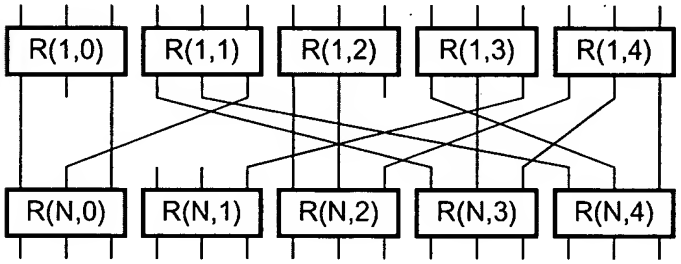


FIG. 59F

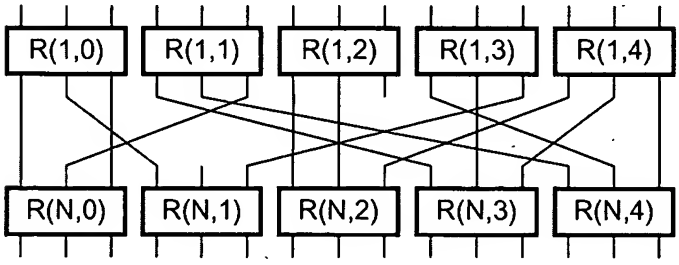


FIG. 59G

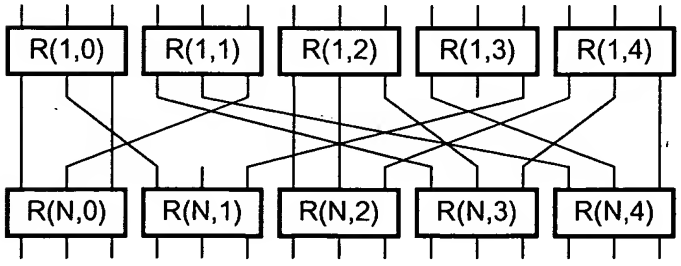


FIG. 59H

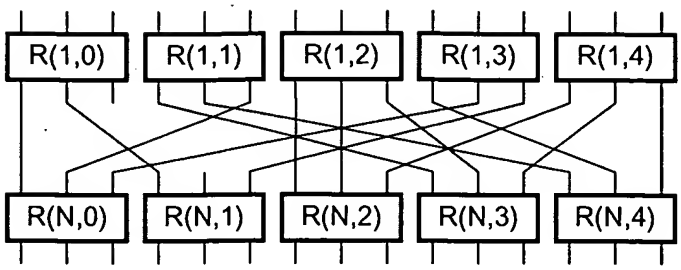
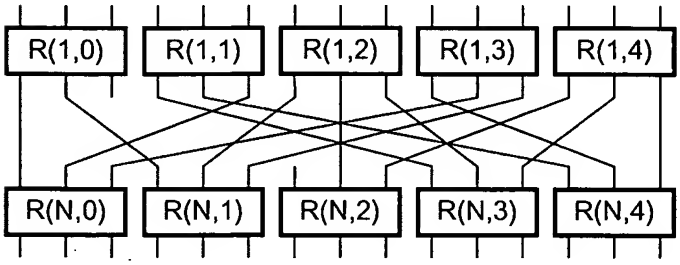


FIG. 59I



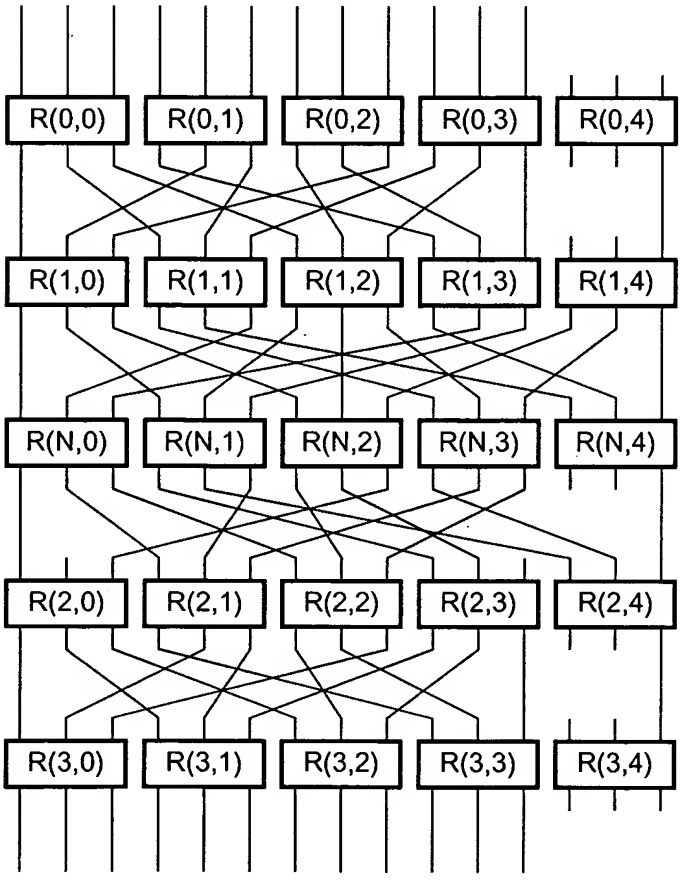


FIG. 59J

FIG. 60A

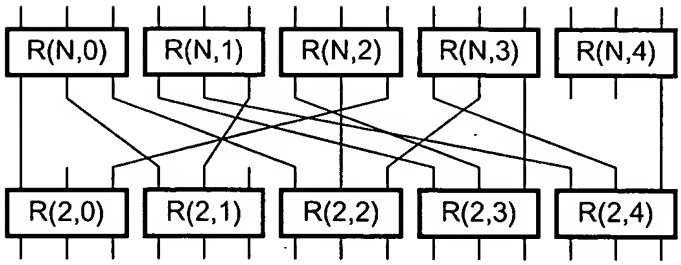


FIG. 60B

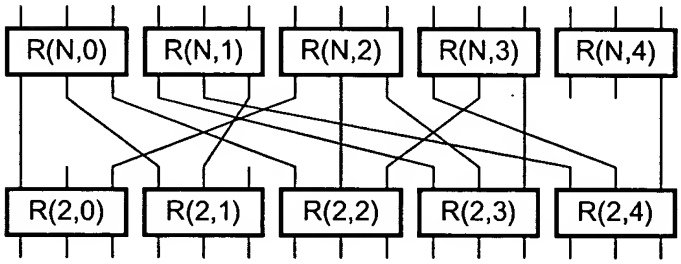


FIG. 60C

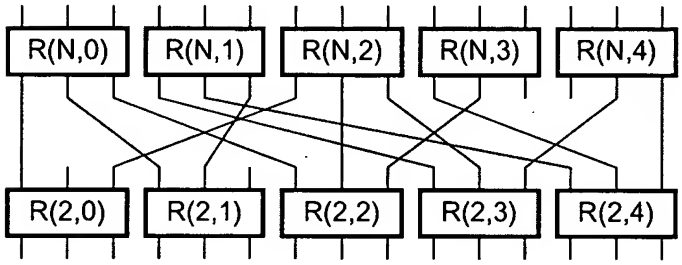


FIG. 60D

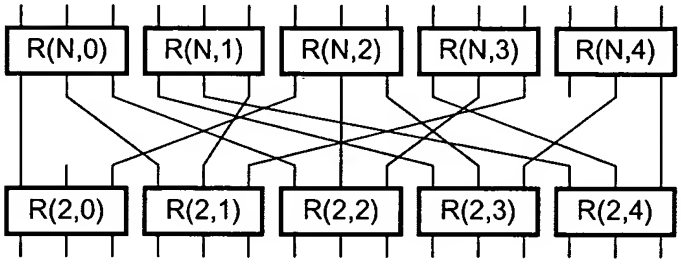


FIG. 60E

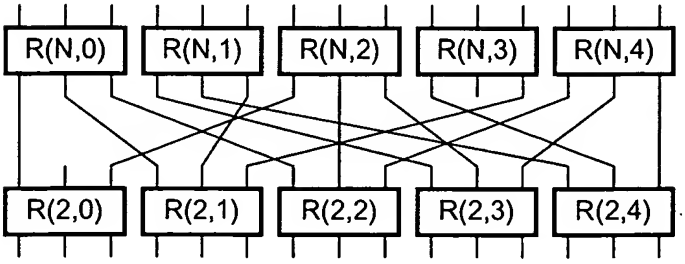


FIG. 60F

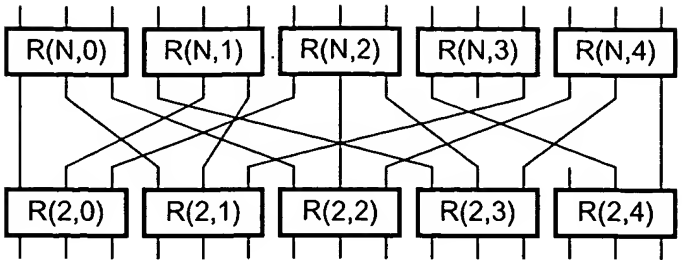


FIG. 60G

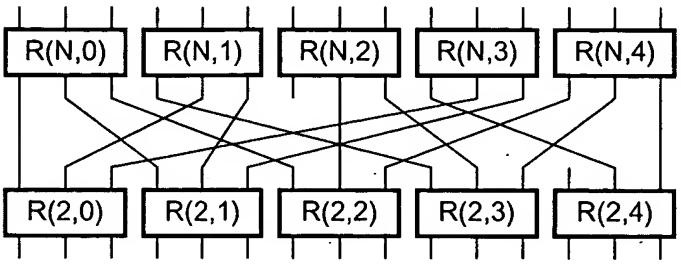


FIG. 60H

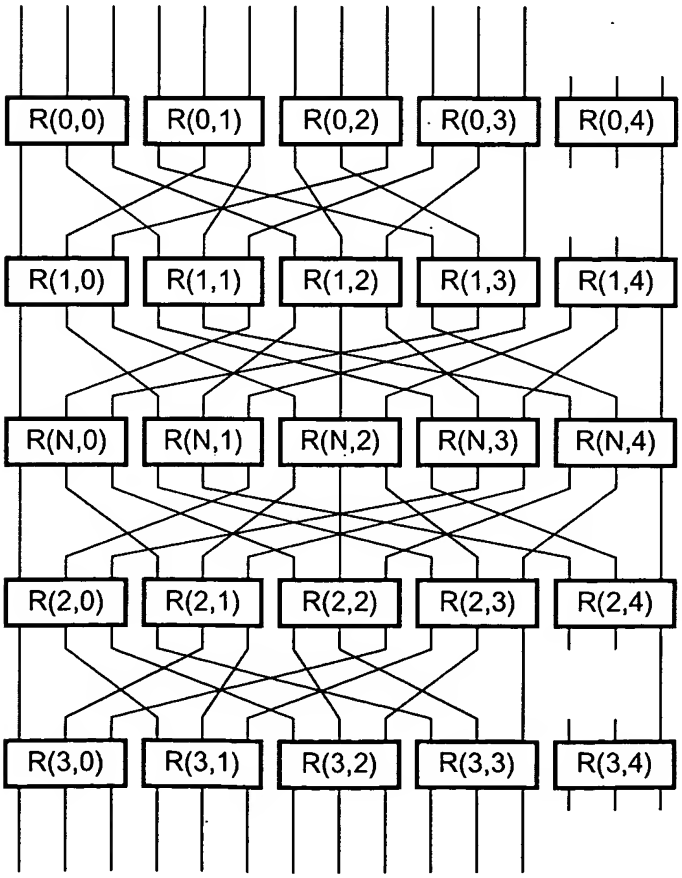


FIG. 61A

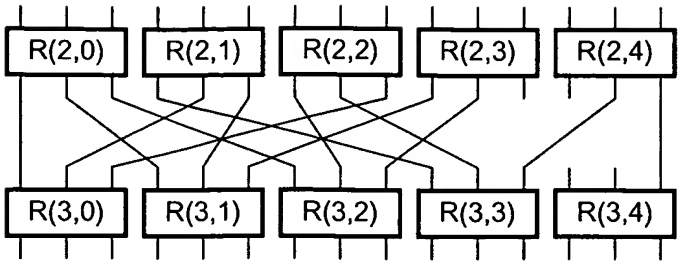


FIG. 61B

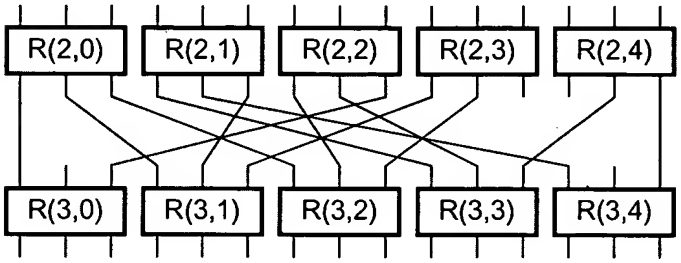


FIG. 61C

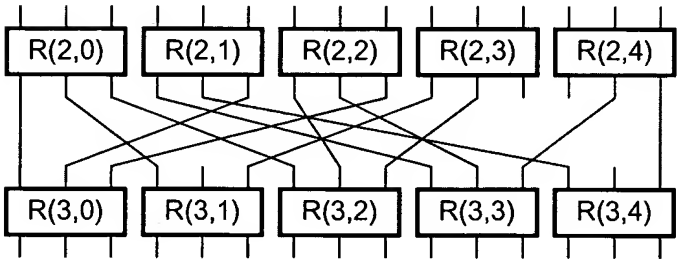


FIG. 61D

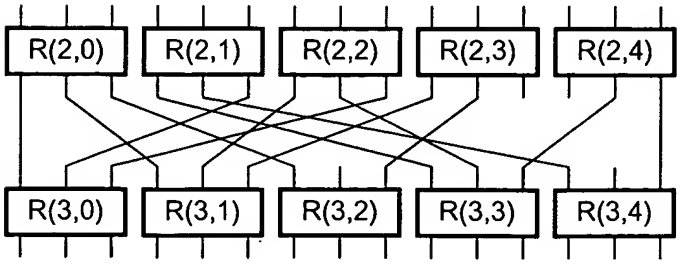


FIG. 61E

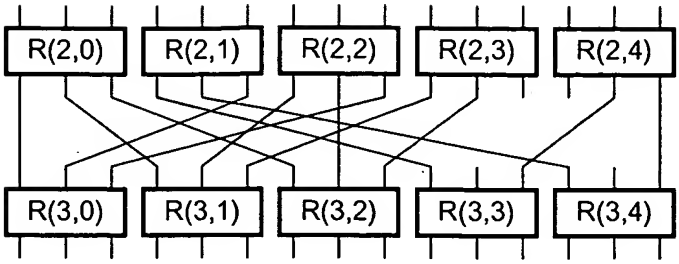


FIG. 61F

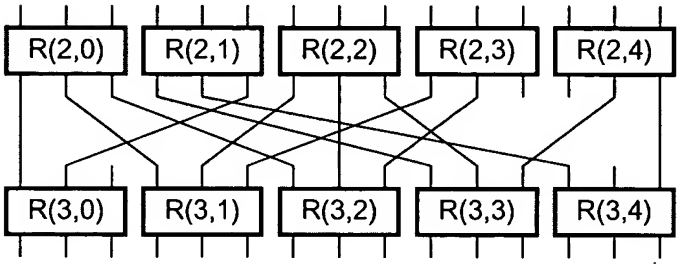


FIG. 61G

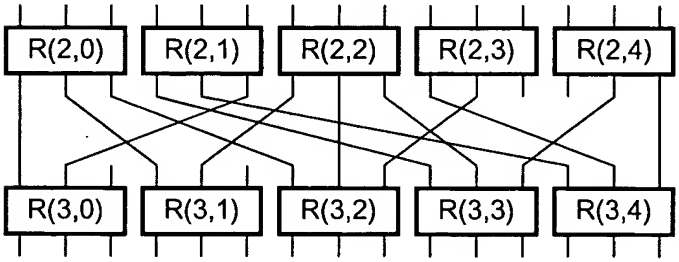


FIG. 61H

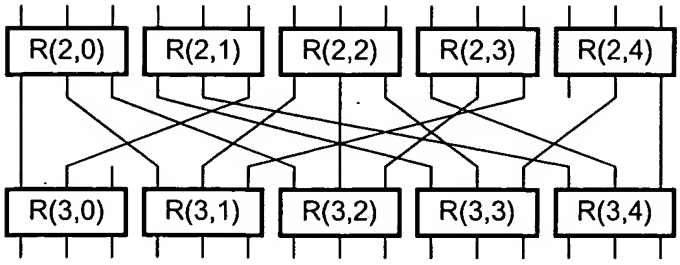
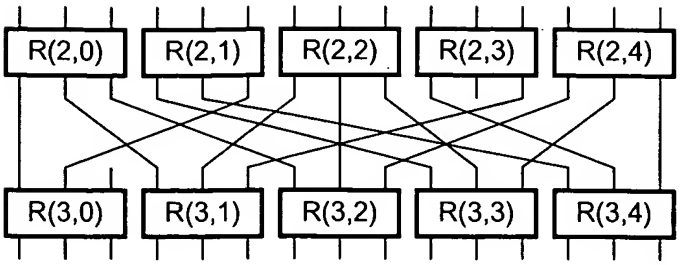


FIG. 61I



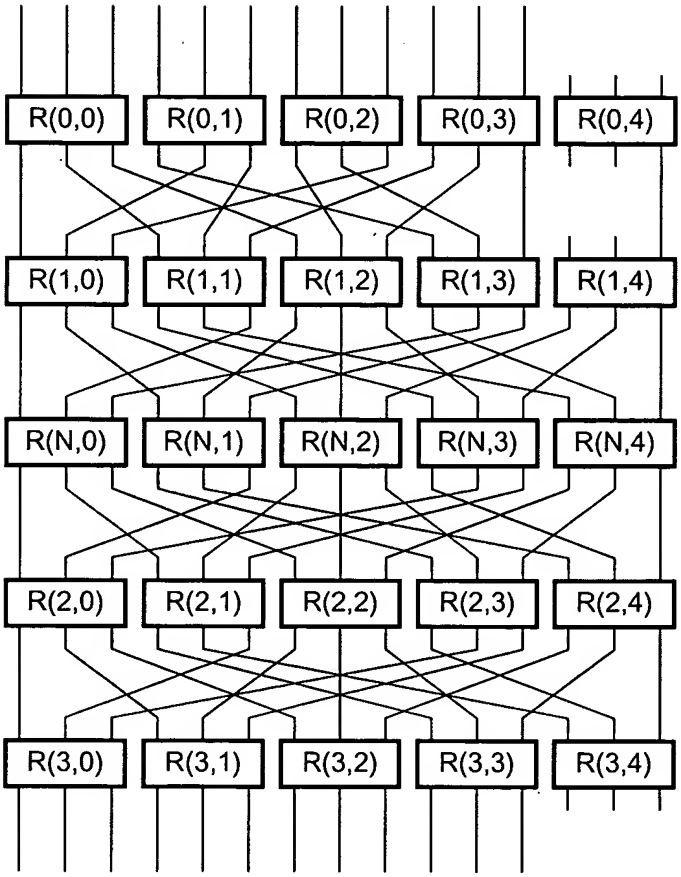


FIG. 61J

FIG. 62A

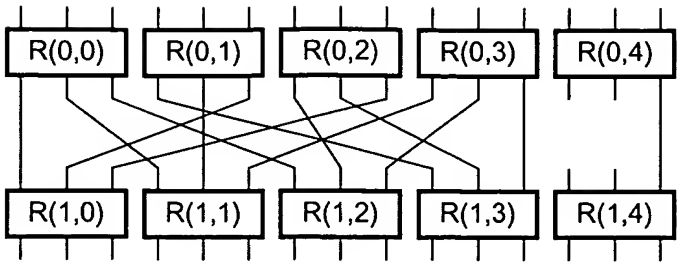


FIG. 62B

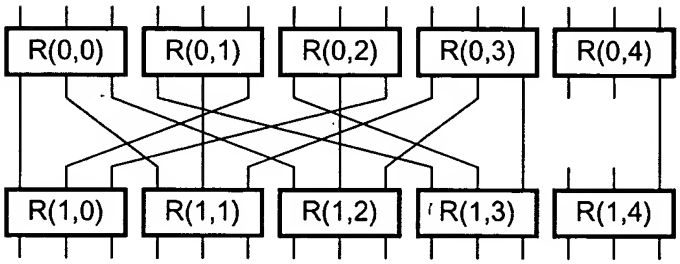


FIG. 62C

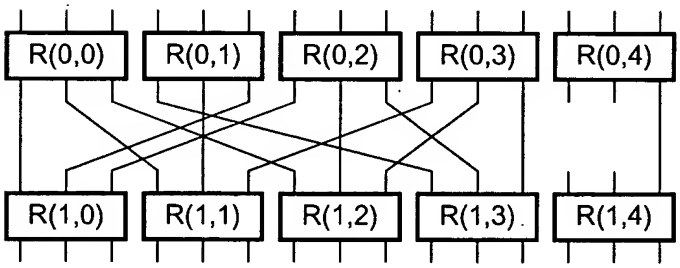


FIG. 62D

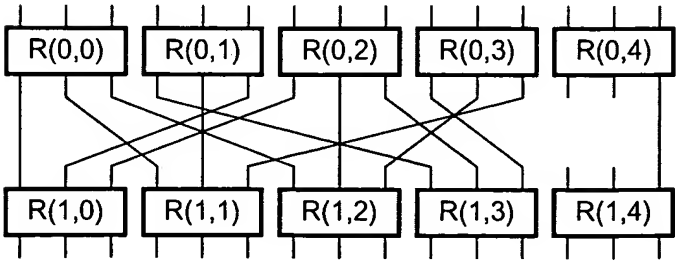


FIG. 62E

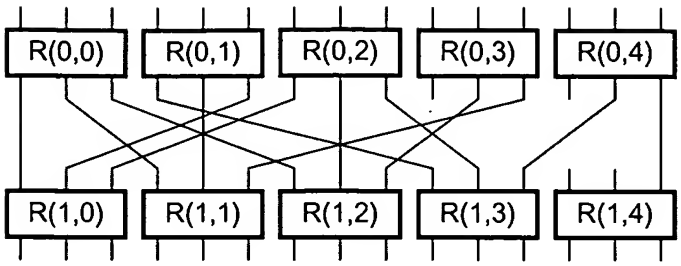


FIG. 62F

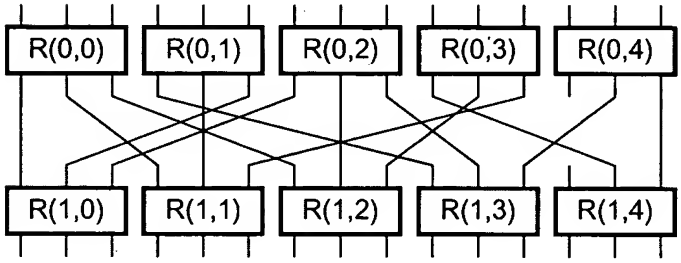


FIG. 62G

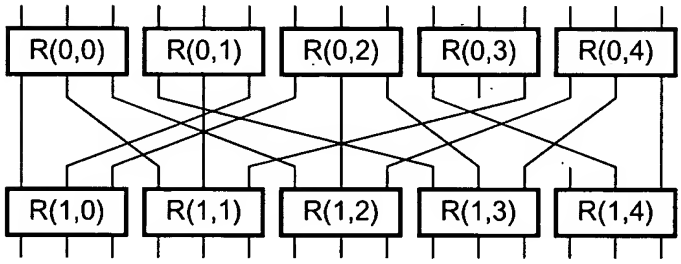


FIG. 62H

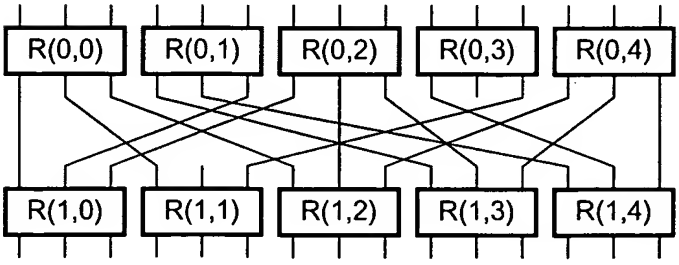
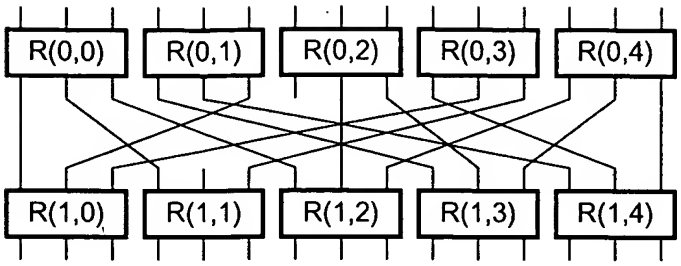


FIG. 62I



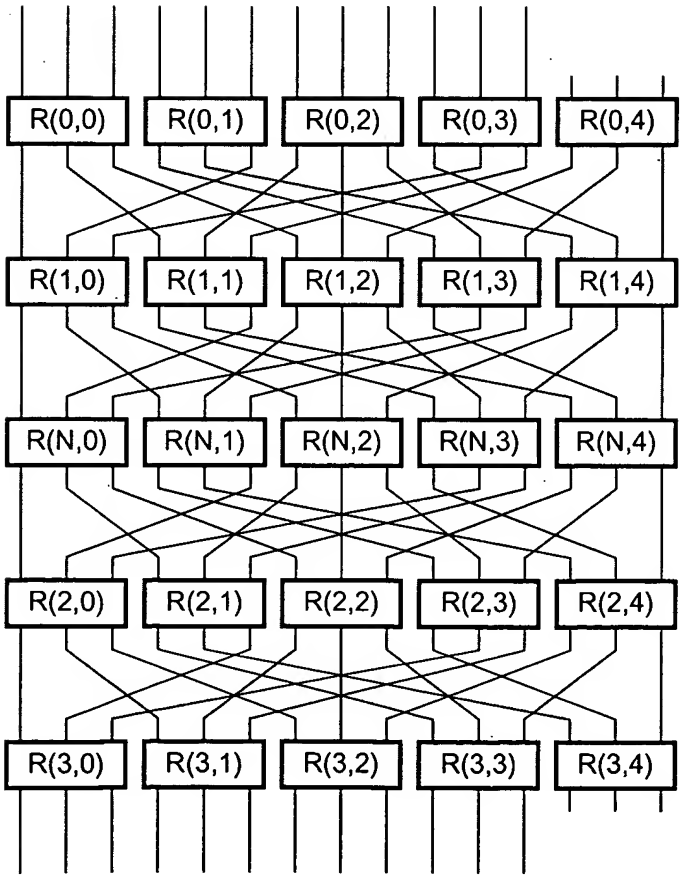
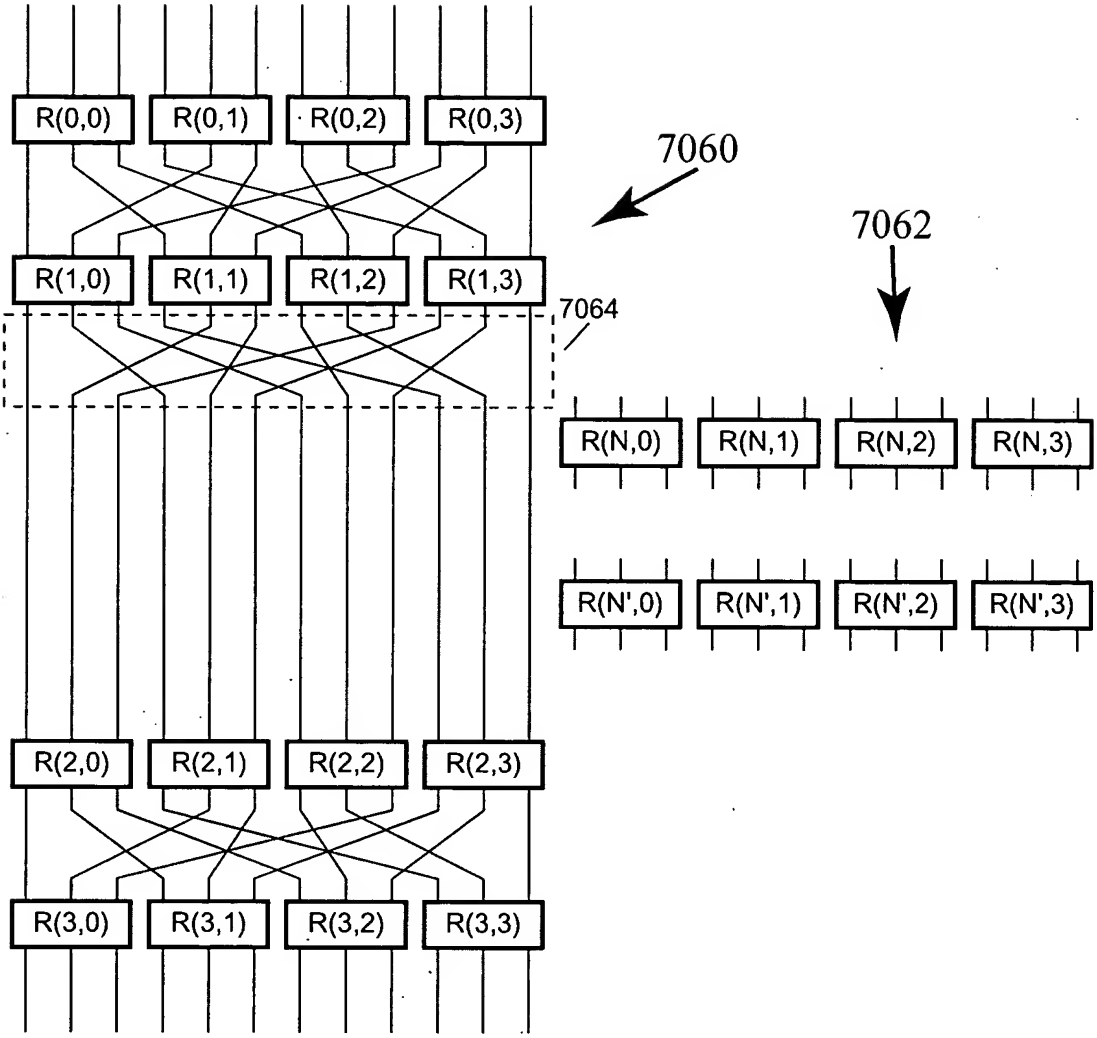


FIG. 62J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R(2,3)
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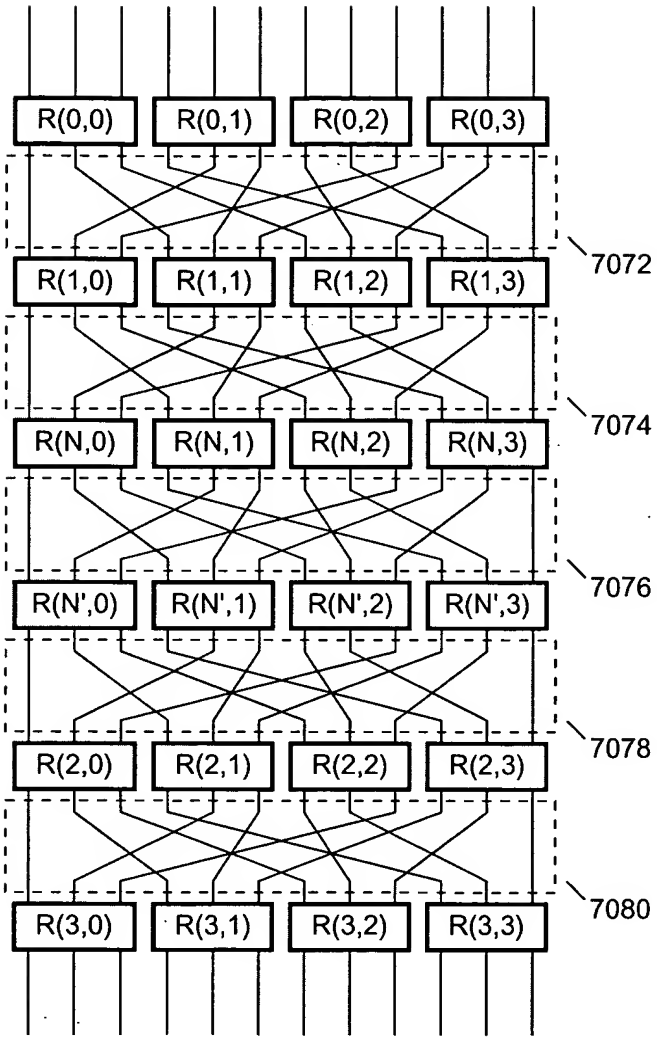
R(3,1)
R(3,2)
R(3,3)

FIG. 63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R(N,2)
R(N,3)
R(N',0)
R(N',1)
R(N',2)
R(N',3)
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R(2,3)
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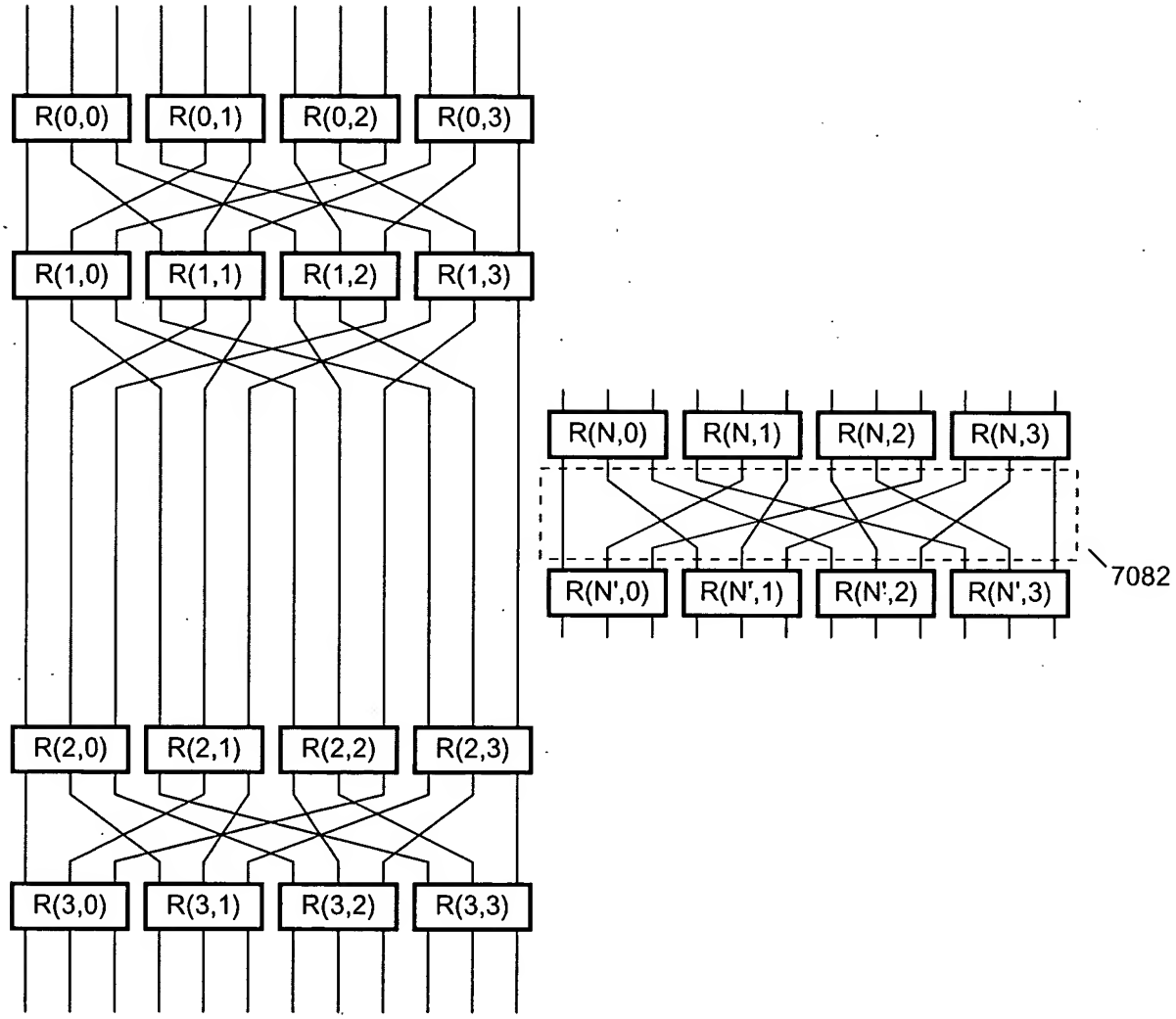
7078
7080

FIG. 64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R(N',3)
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FIG. 65

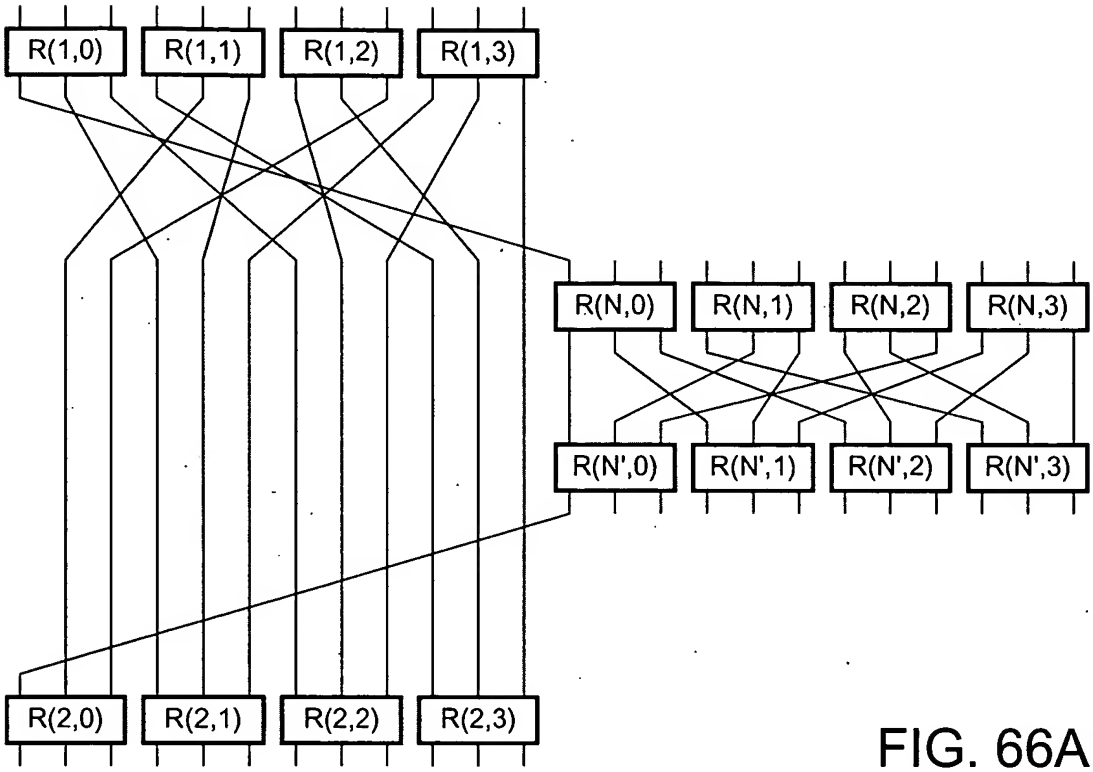


FIG. 66A

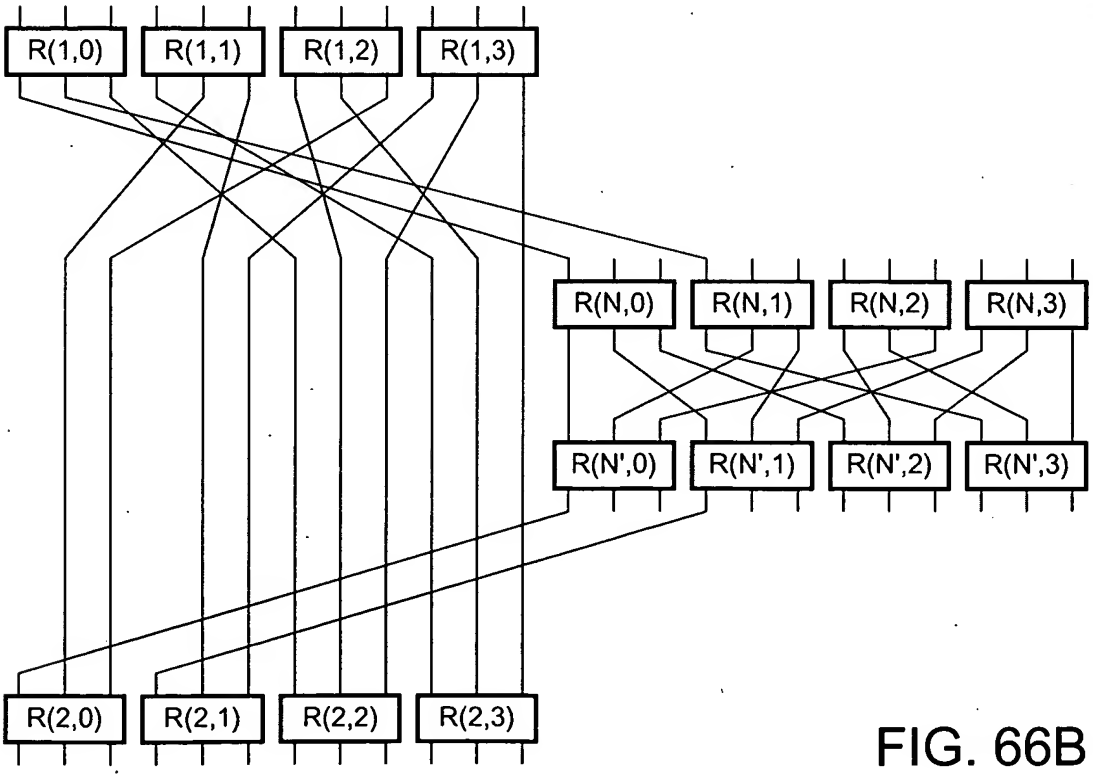


FIG. 66B

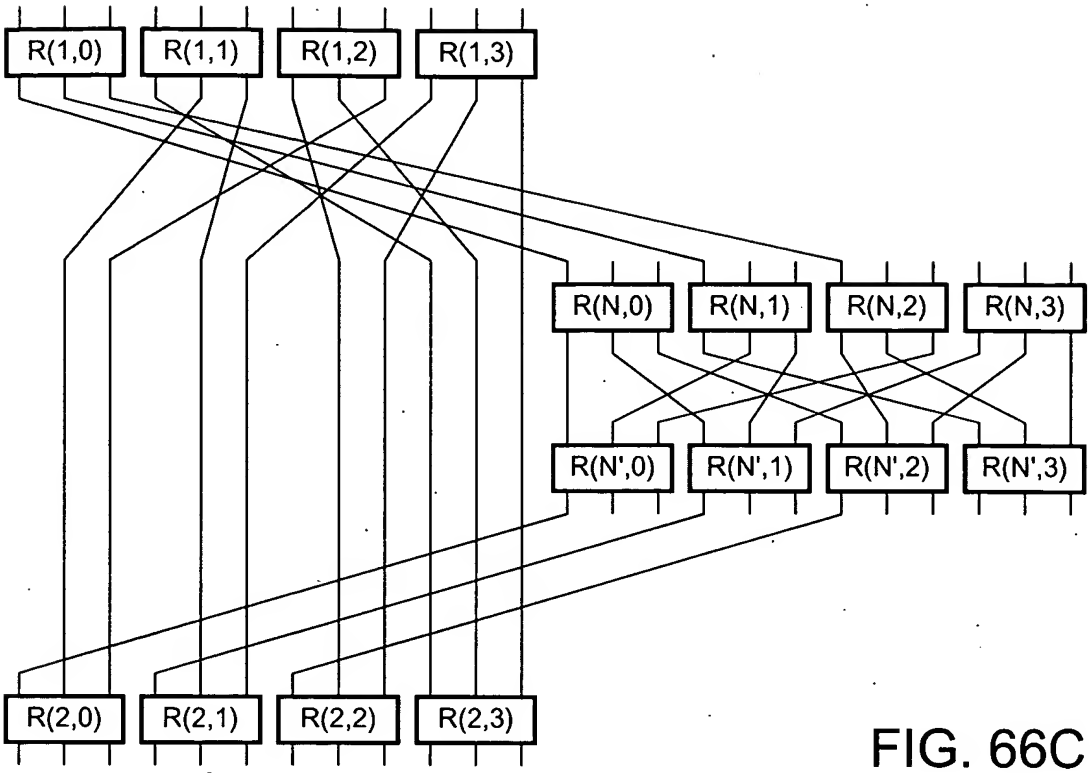


FIG. 66C

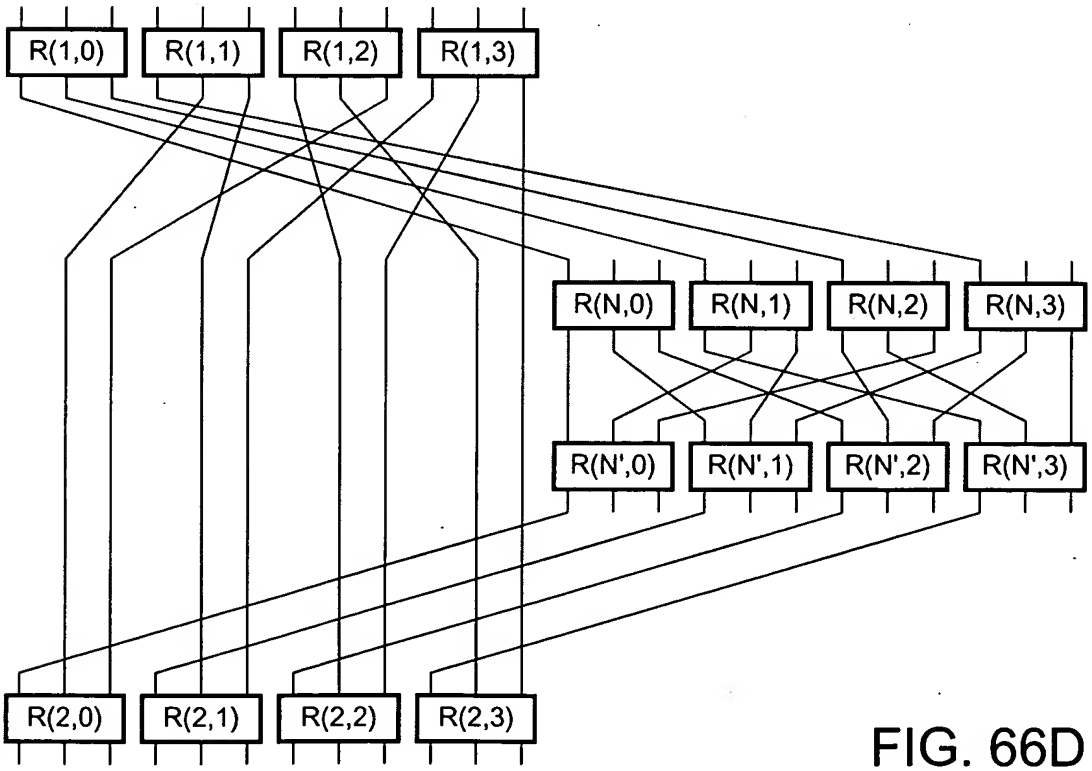


FIG. 66D

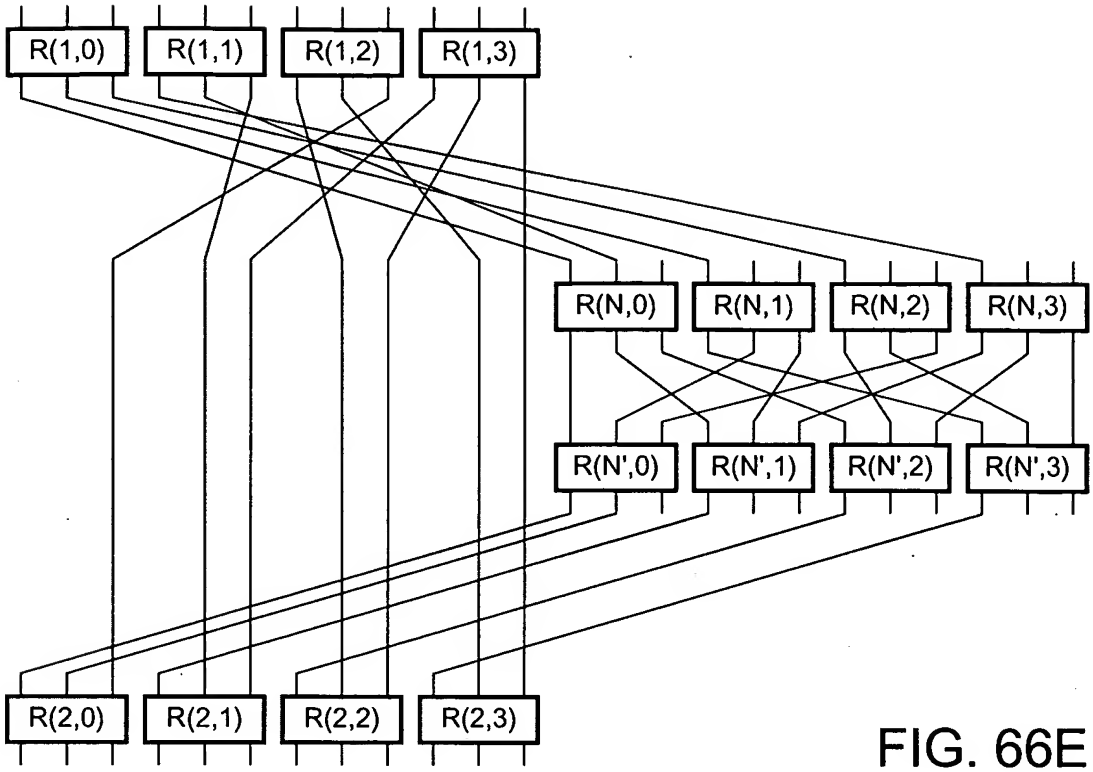


FIG. 66E

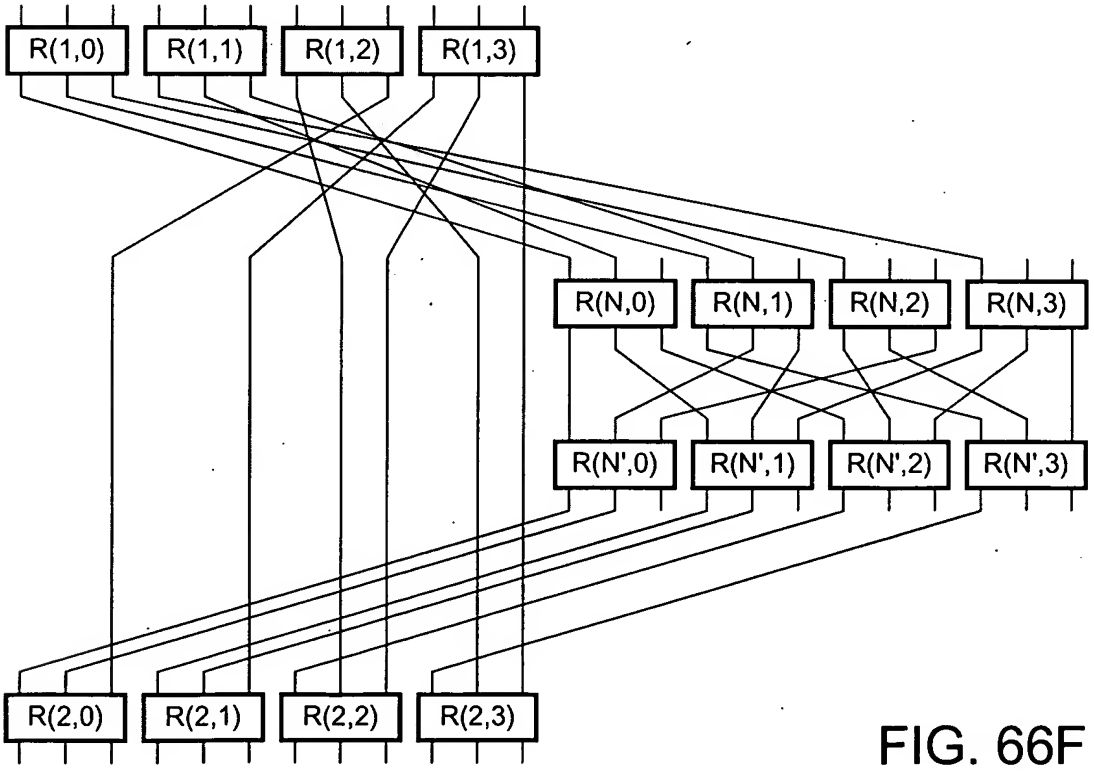


FIG. 66F

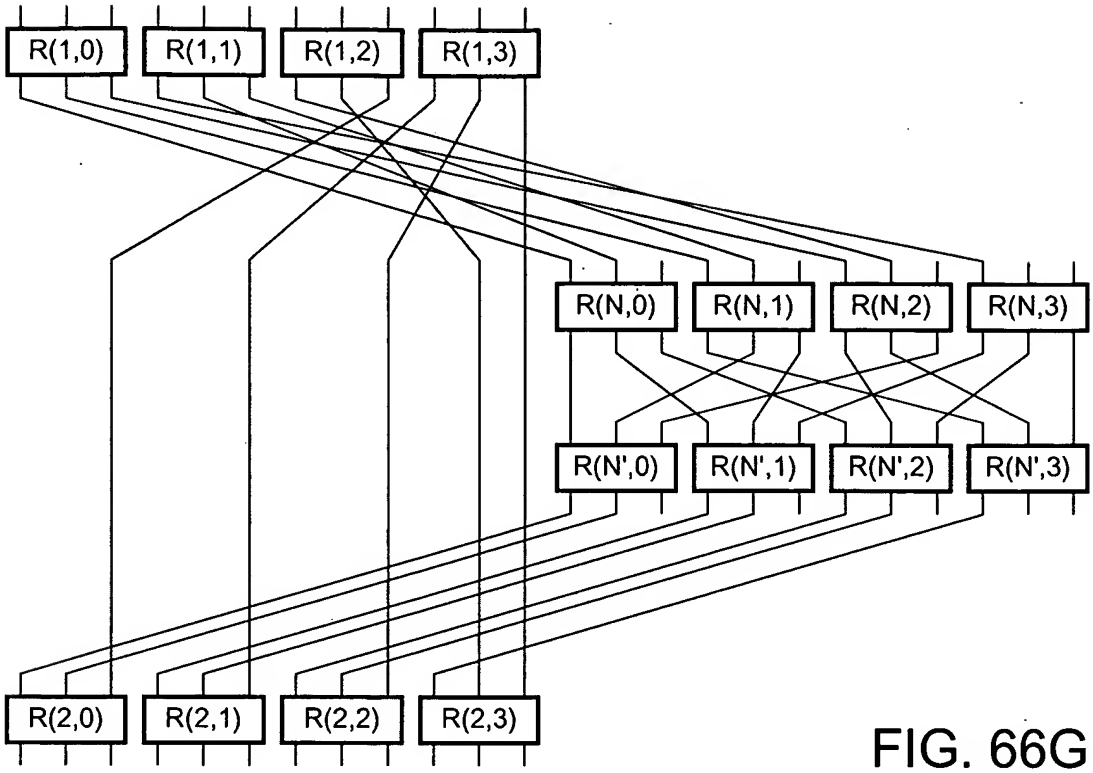


FIG. 66G

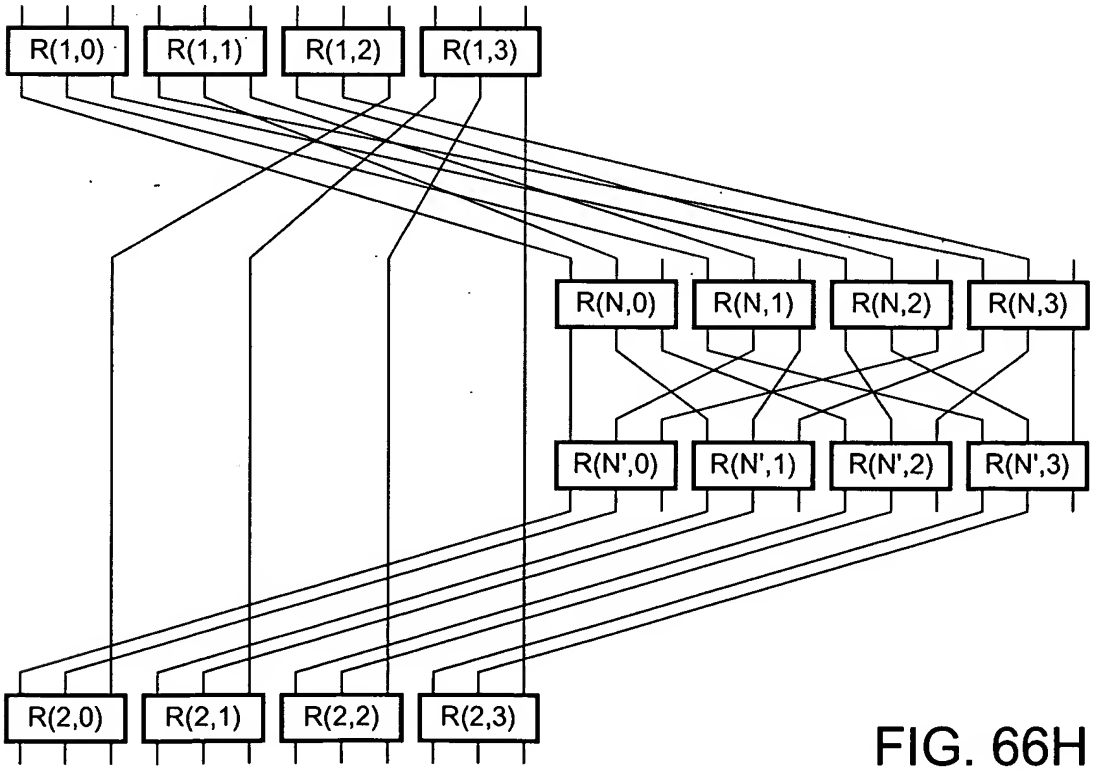


FIG. 66H

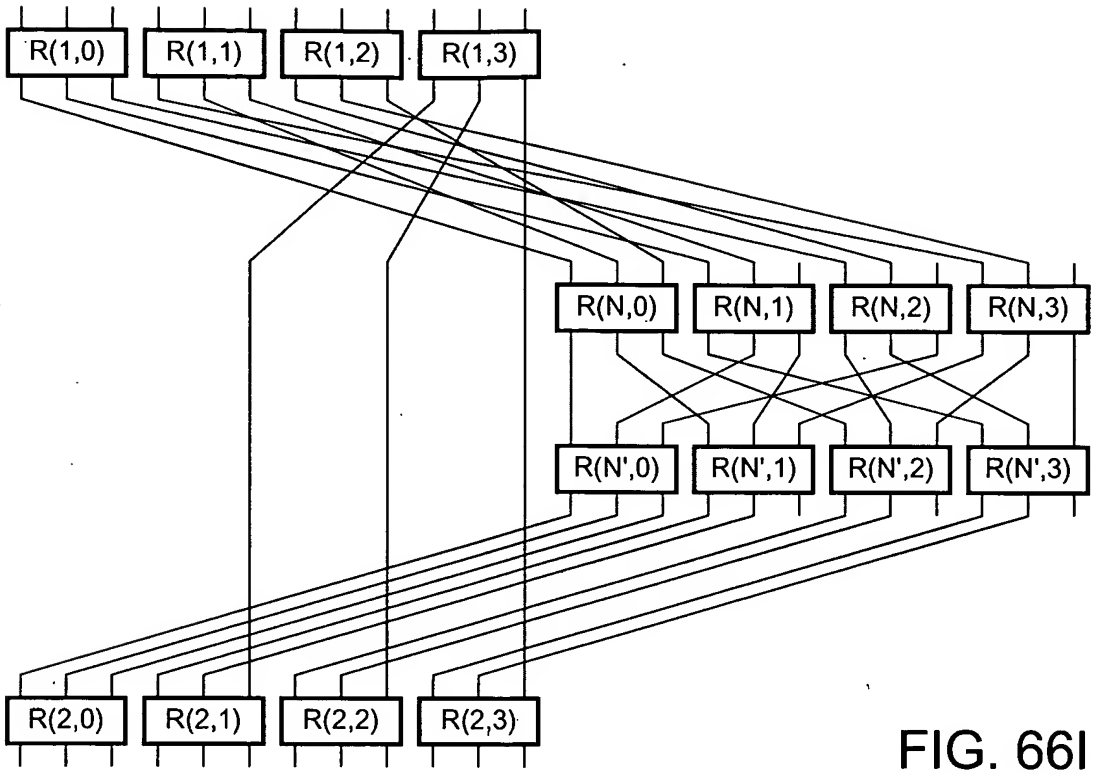


FIG. 66I

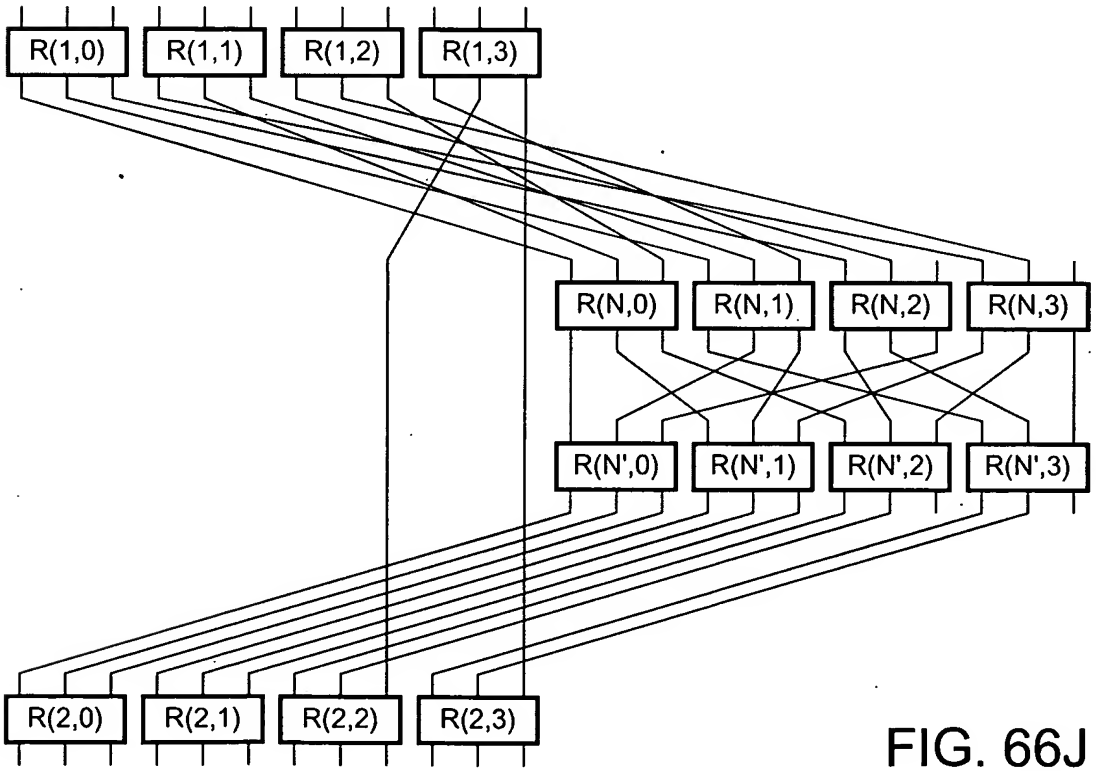


FIG. 66J

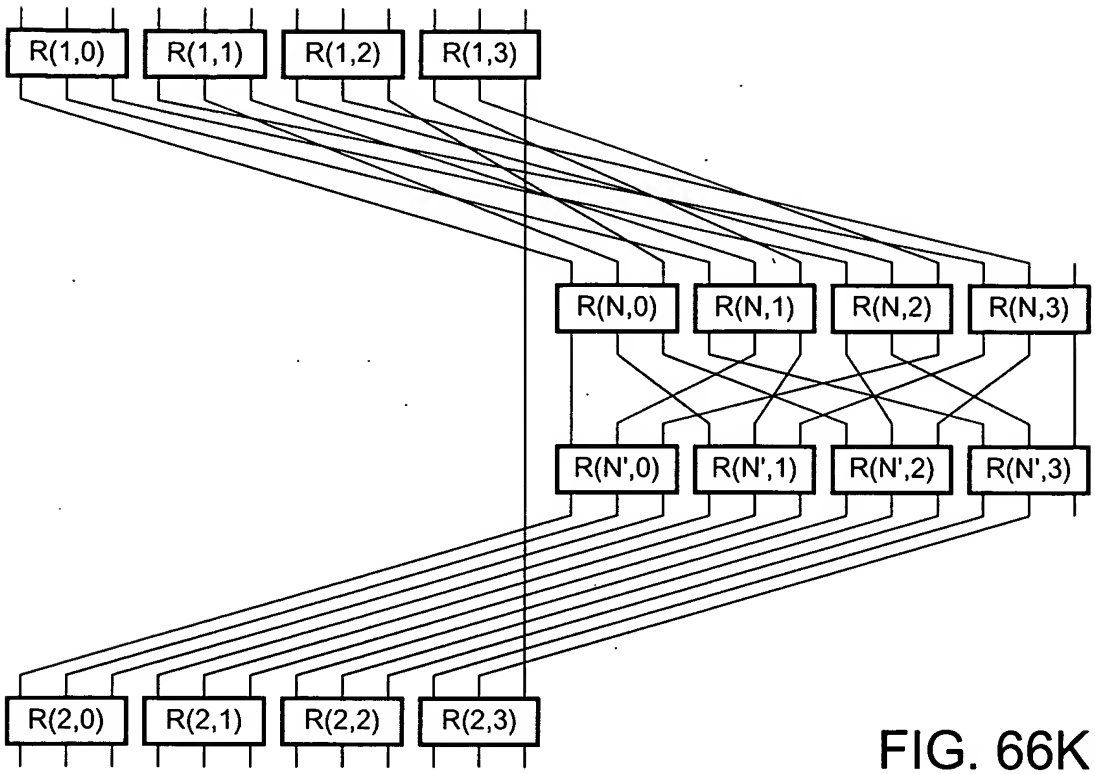


FIG. 66K

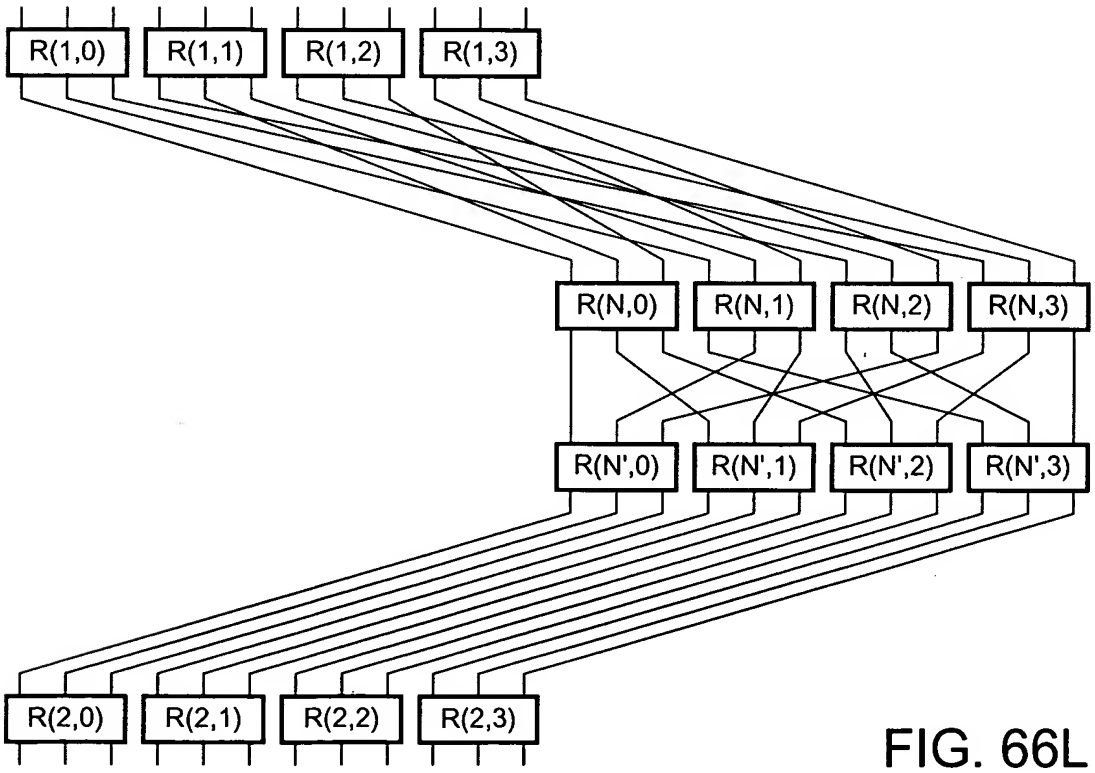
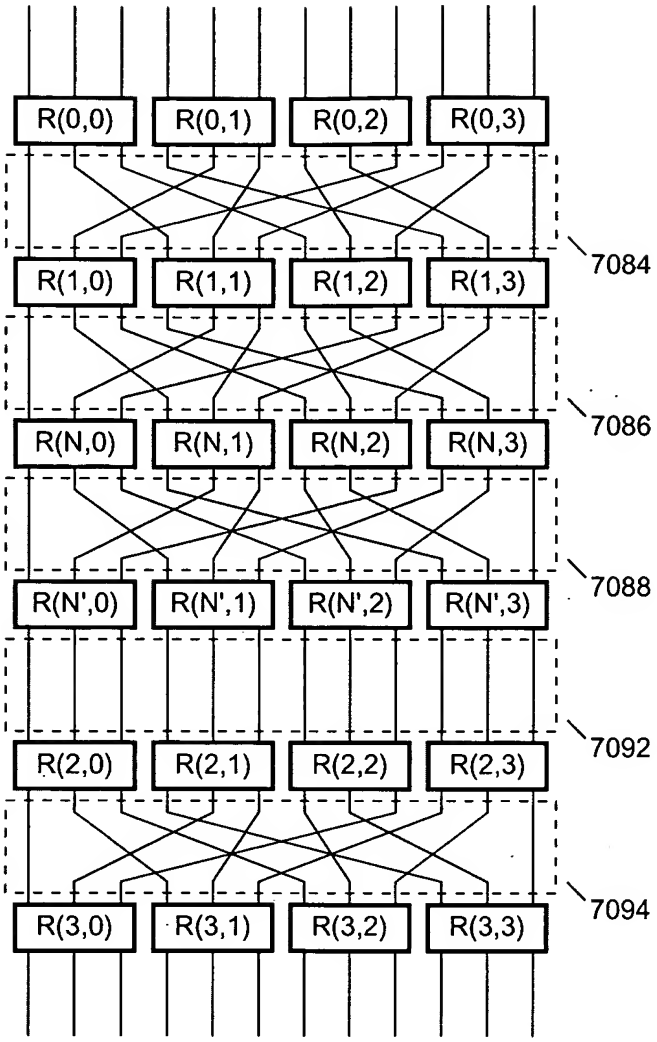


FIG. 66L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R(1,2)
R(1,3)
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7092
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FIG. 66M

FIG. 67A

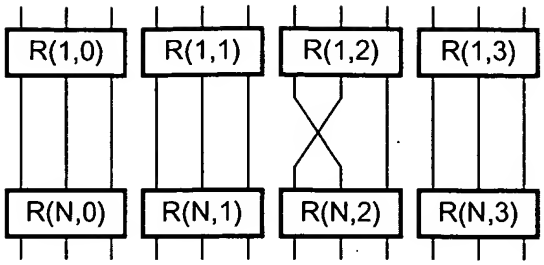


FIG. 67B

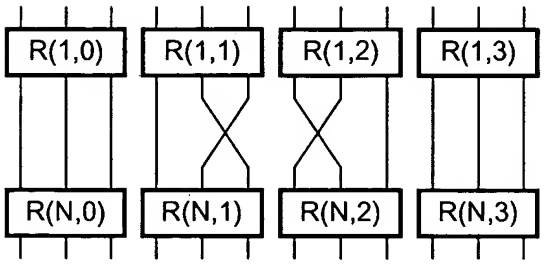


FIG. 67C

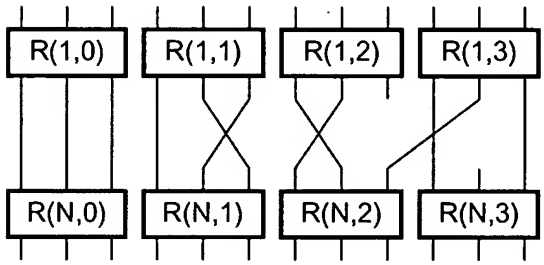


FIG. 67D

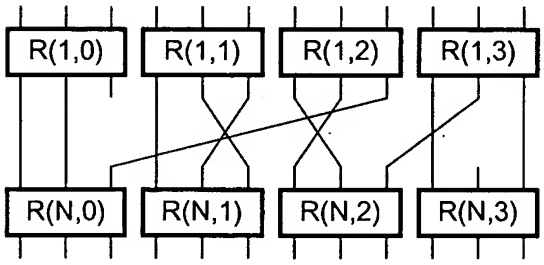


FIG. 67E

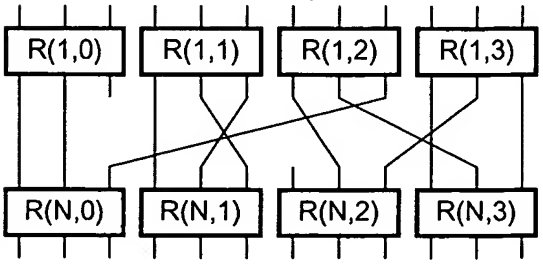


FIG. 67F

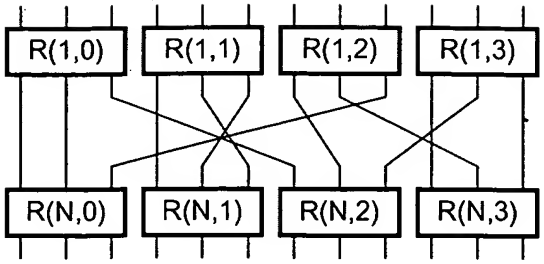


FIG. 67G

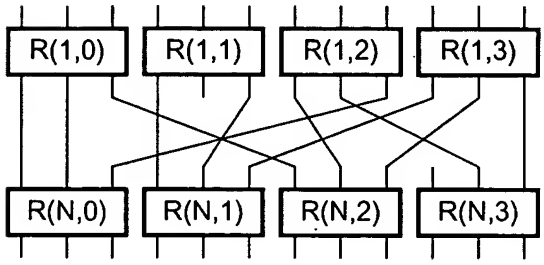


FIG. 67H

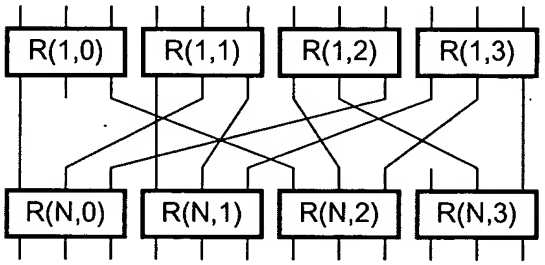


FIG. 67I

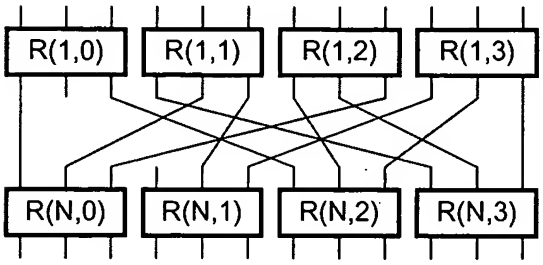
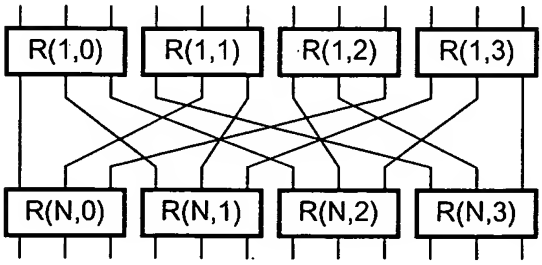
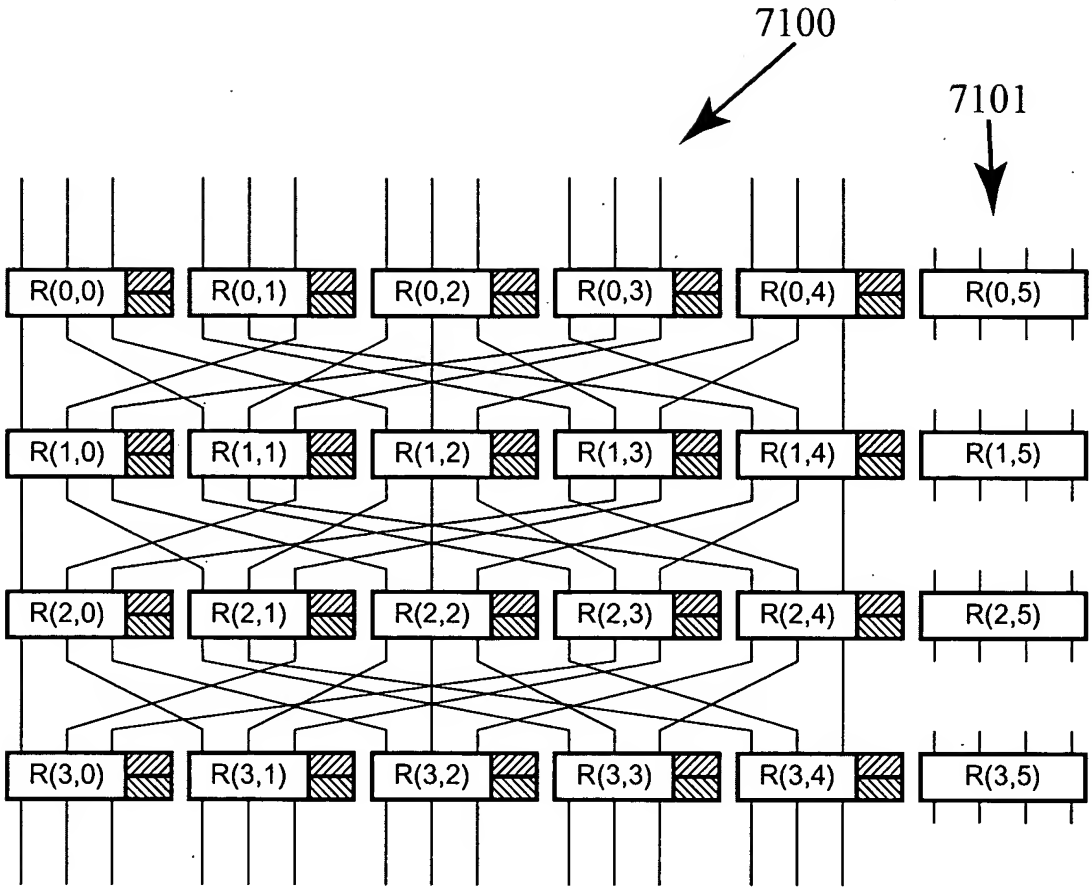


FIG. 67J

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R(2,2)
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R(2,4)
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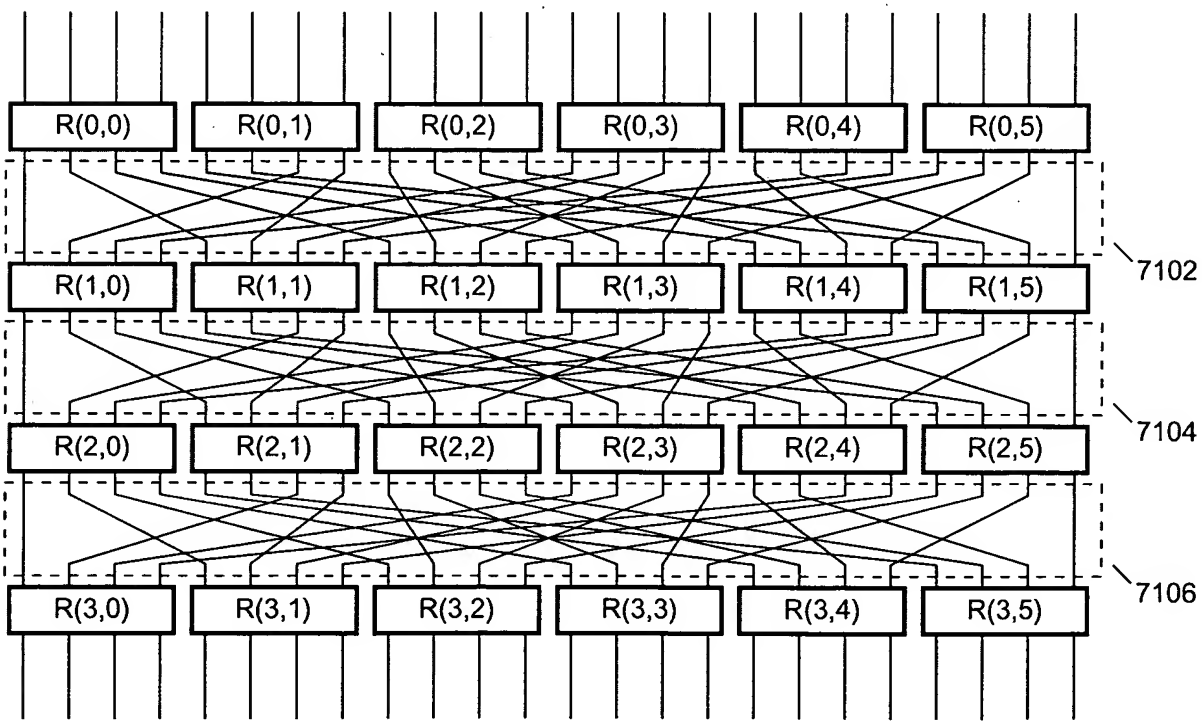
R(3,5)

FIG. 68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R(2,2)
R(2,3)
R(2,4)
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7102
7104
7106

FIG. 69

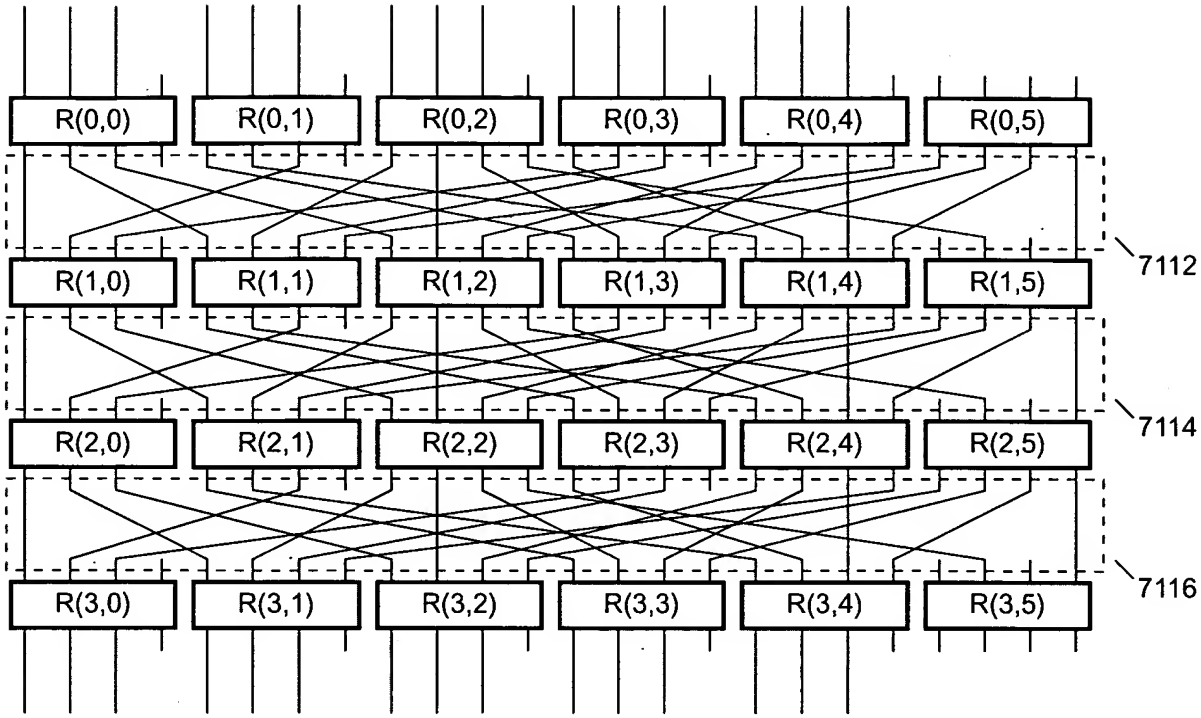


FIG. 70

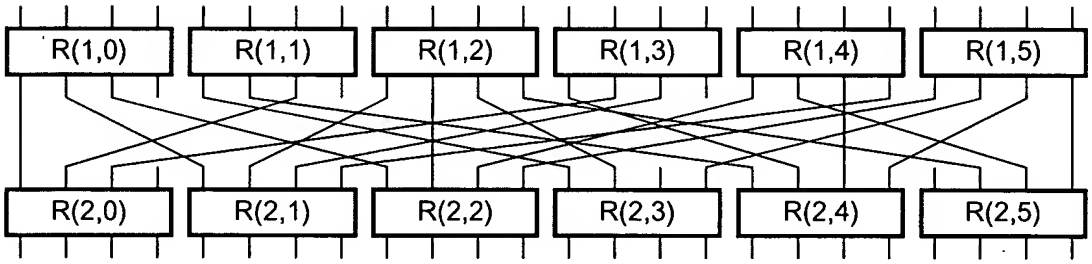


FIG. 71A

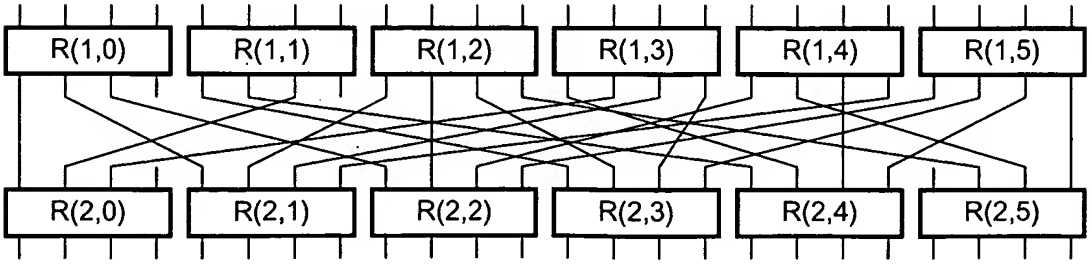


FIG. 71B

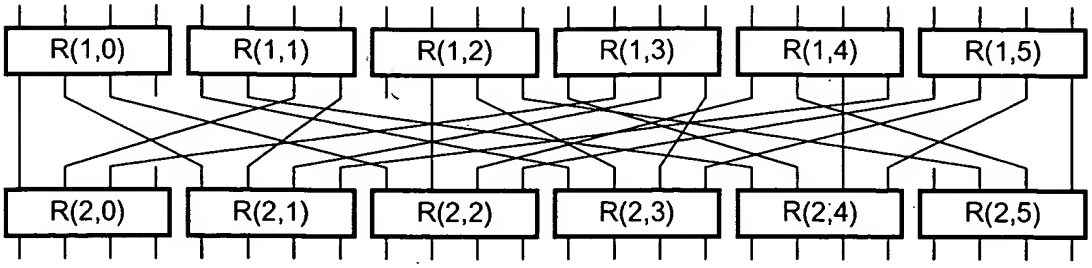


FIG. 71C

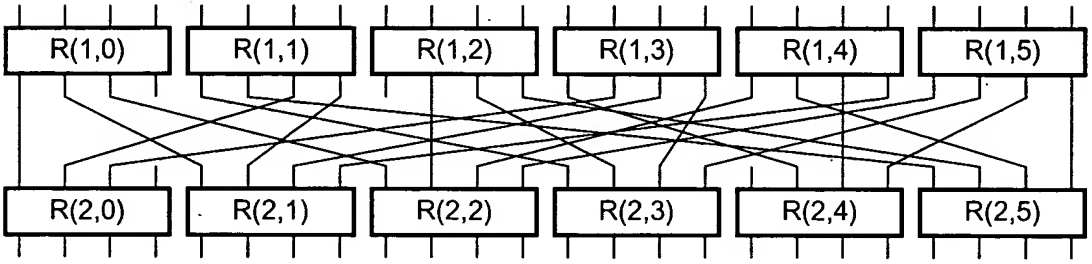


FIG. 71D

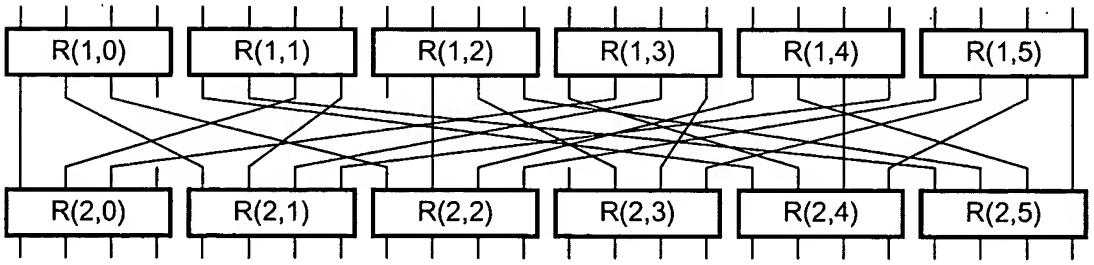


FIG. 71E

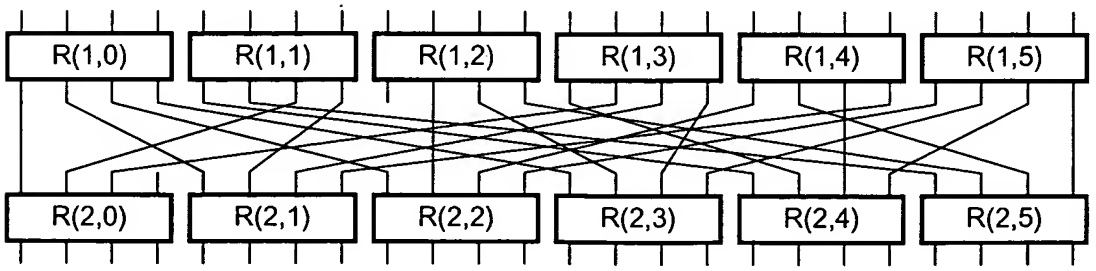


FIG. 71F

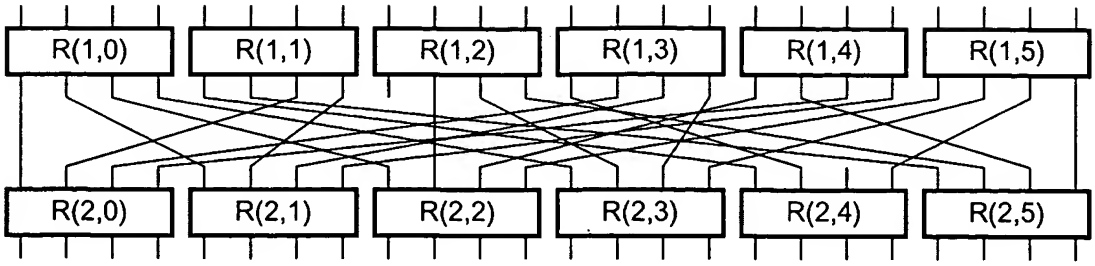


FIG. 71G

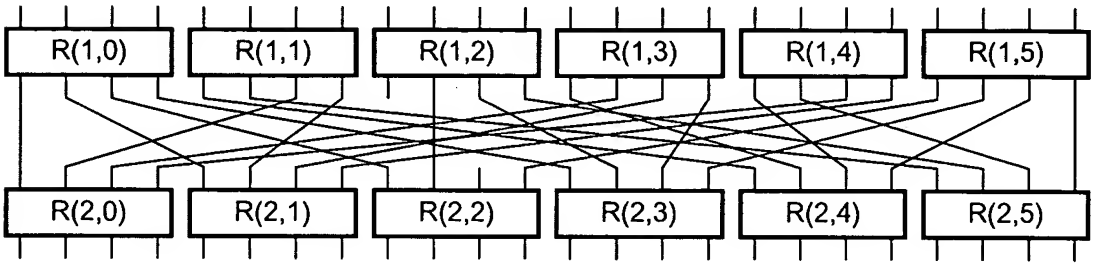


FIG. 71H

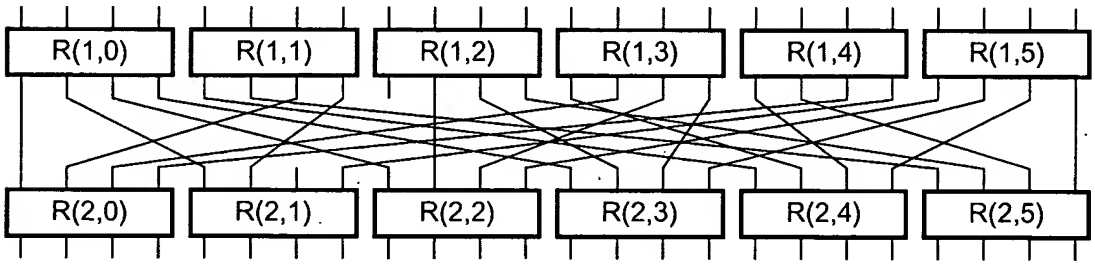


FIG. 71I

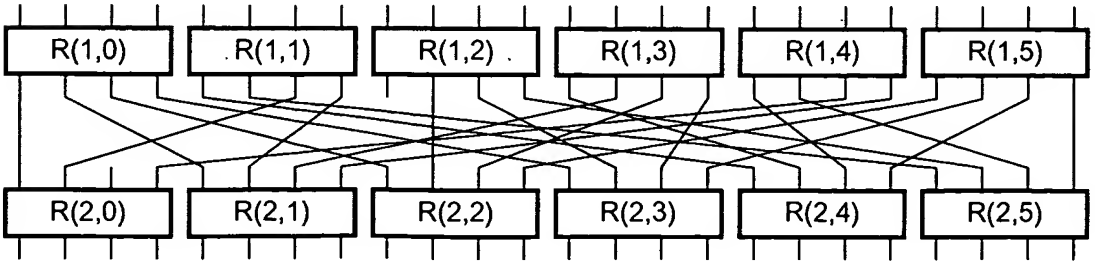


FIG. 71J

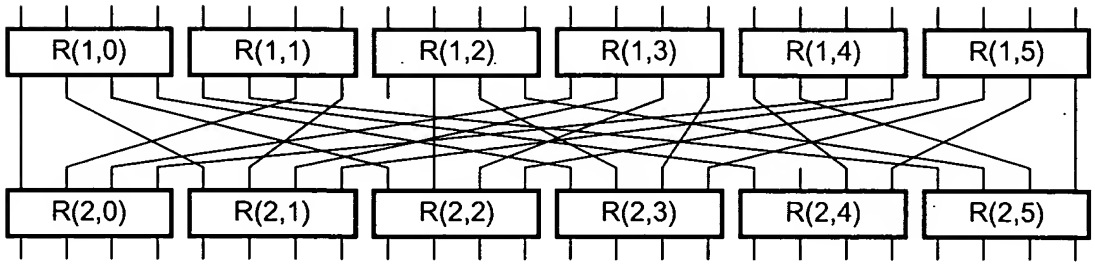


FIG. 71K

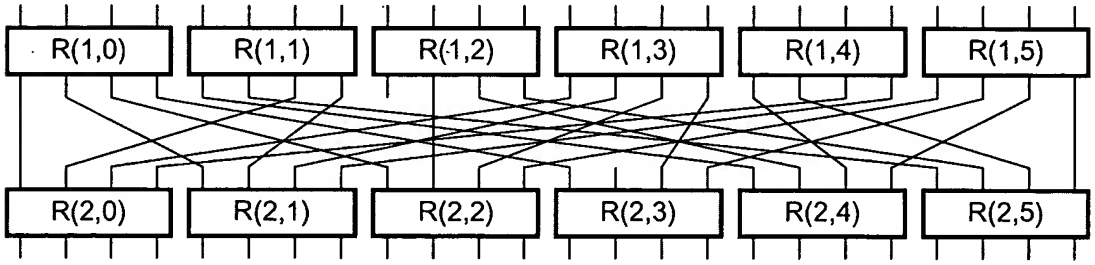


FIG. 71L

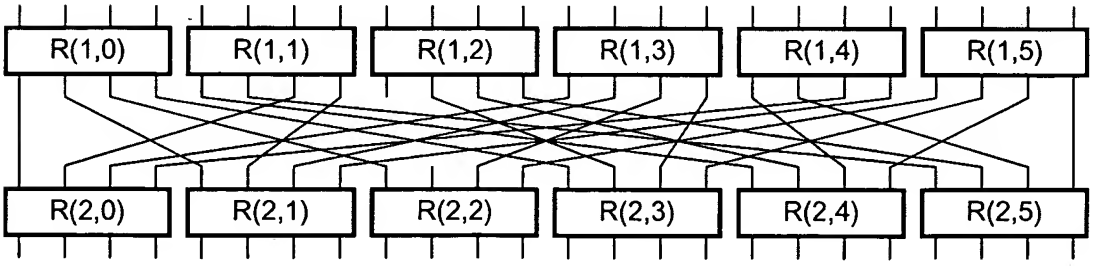


FIG. 71M

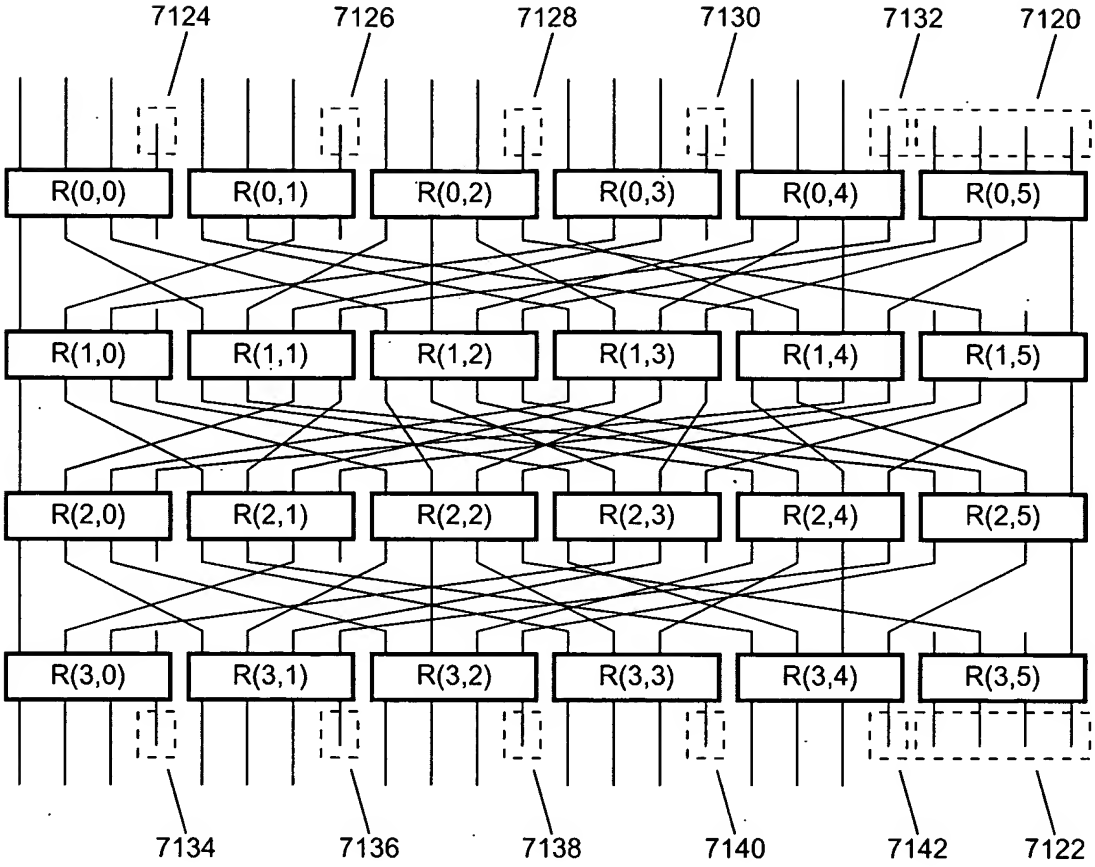


FIG. 71N

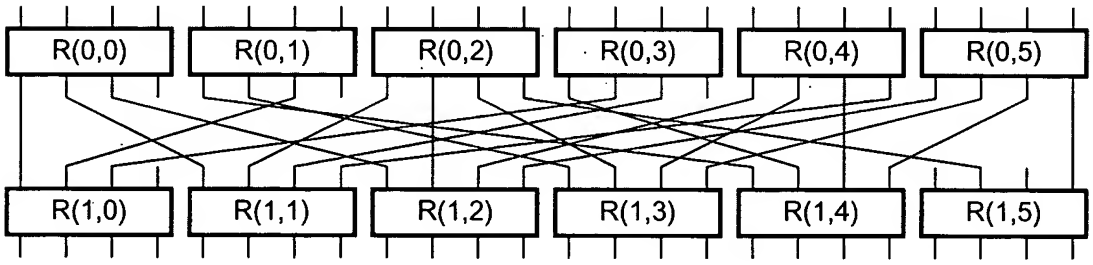


FIG. 72A

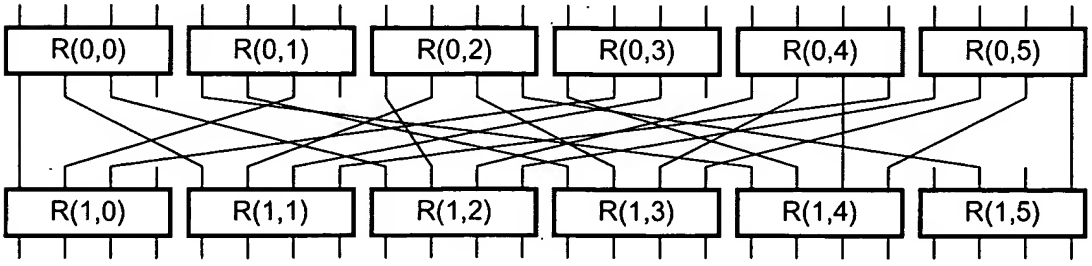


FIG. 72B

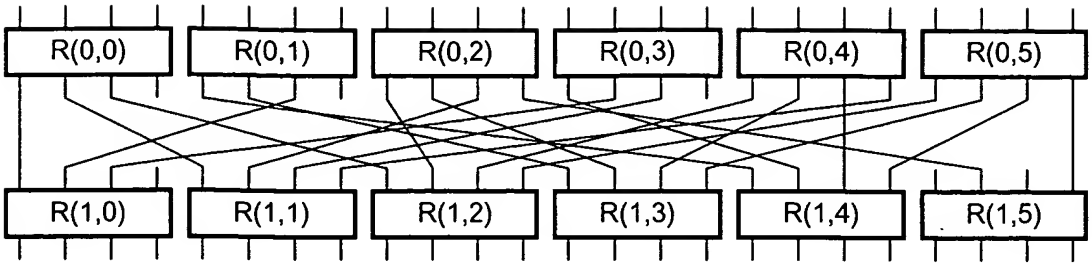


FIG. 72C

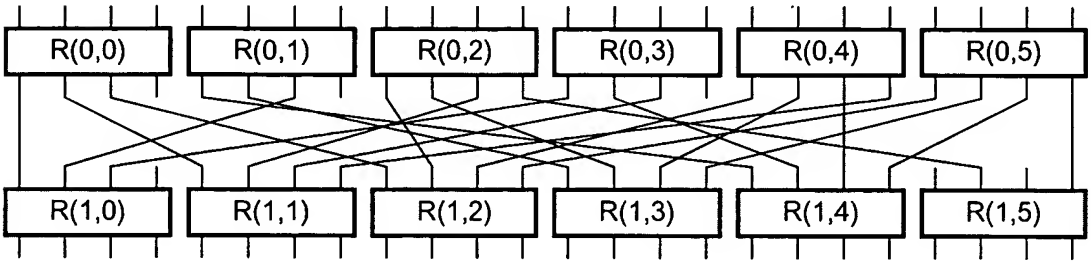


FIG. 72D

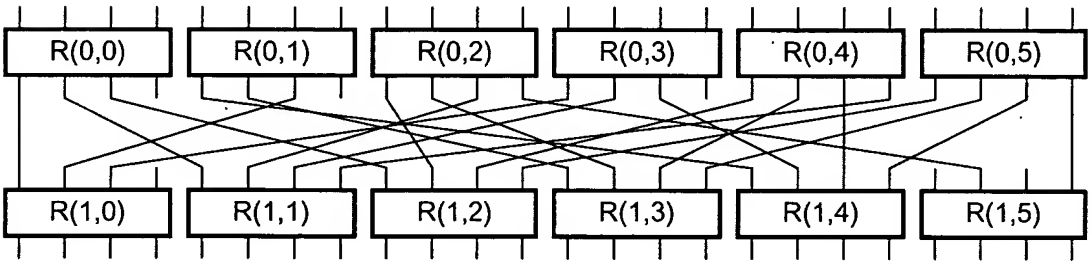


FIG. 72E

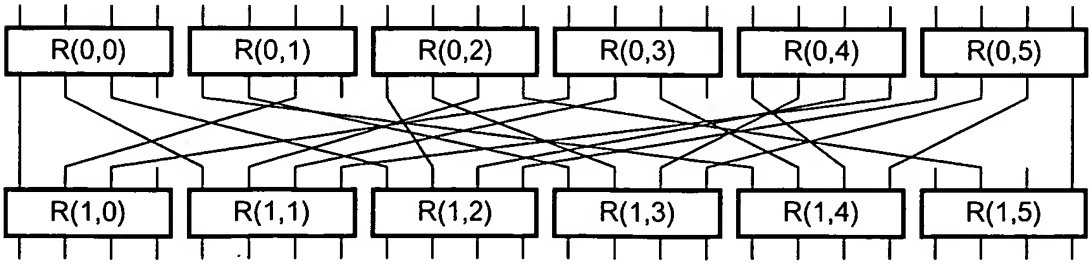


FIG. 72F

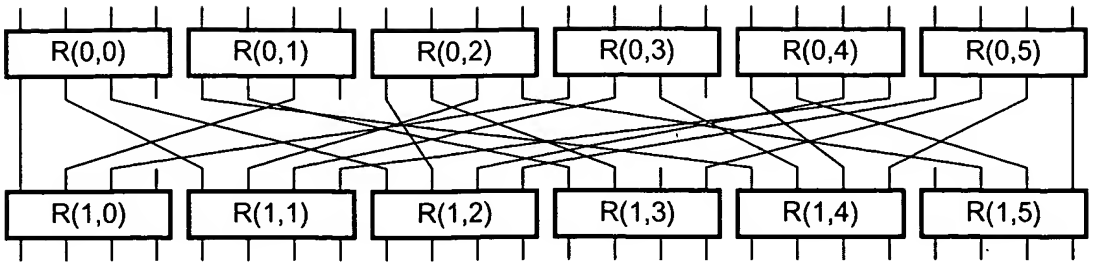


FIG. 72G

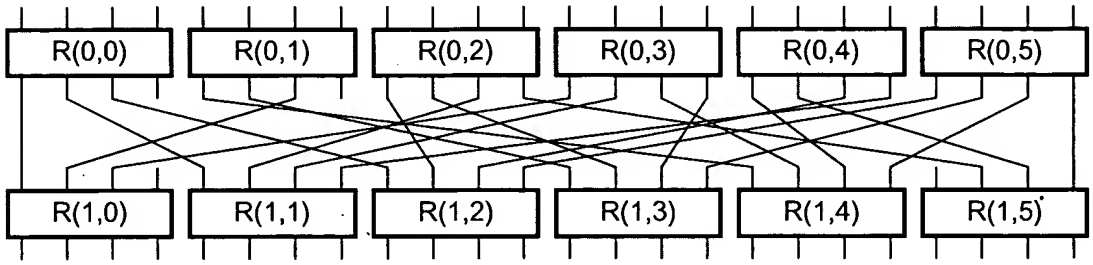


FIG. 72H

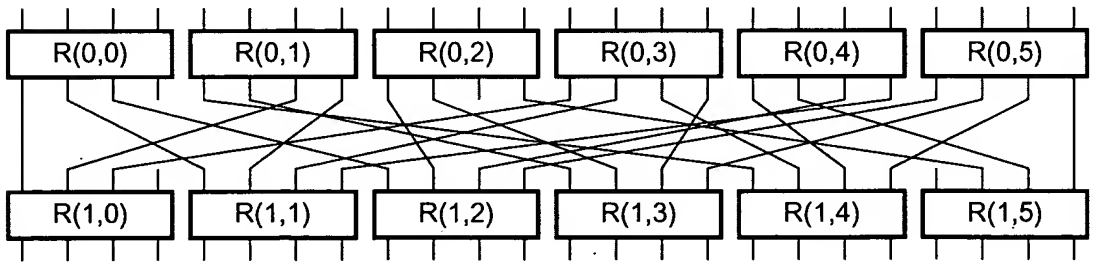


FIG. 72I

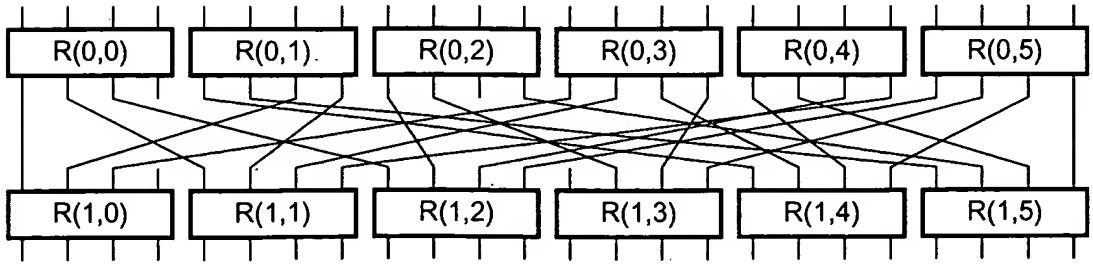


FIG. 72J

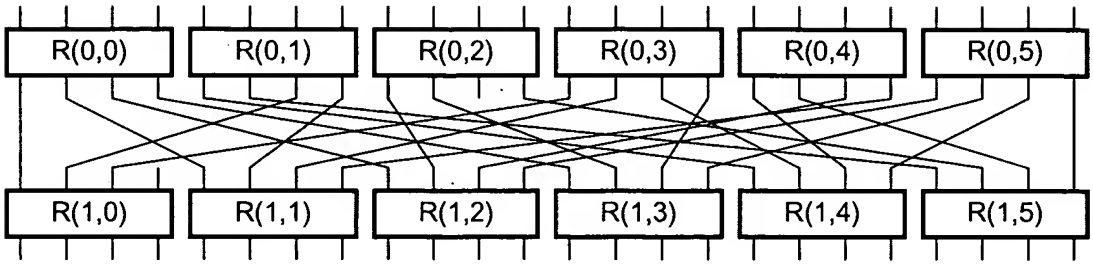


FIG. 72K

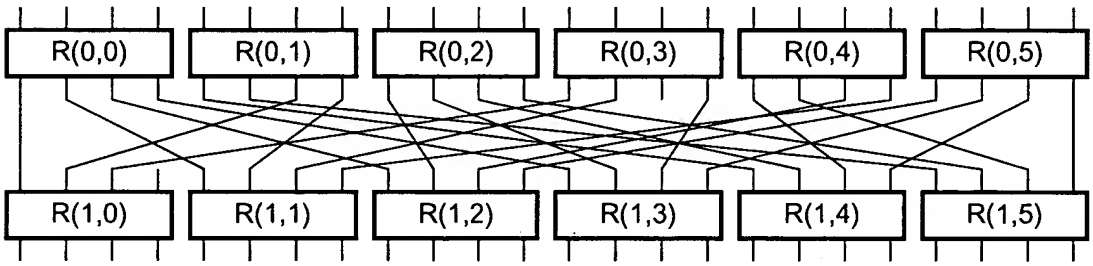


FIG. 72L

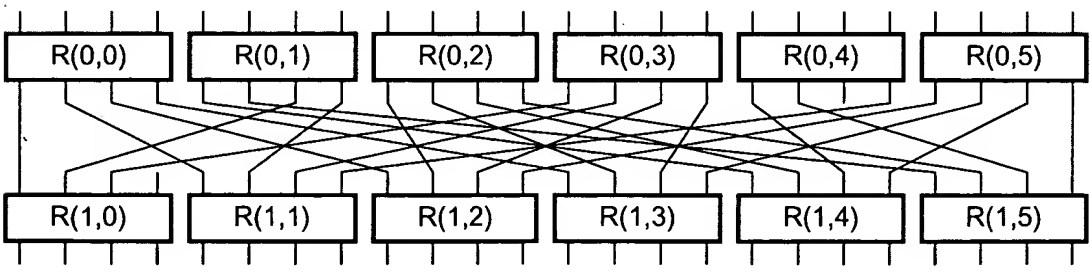


FIG. 72M

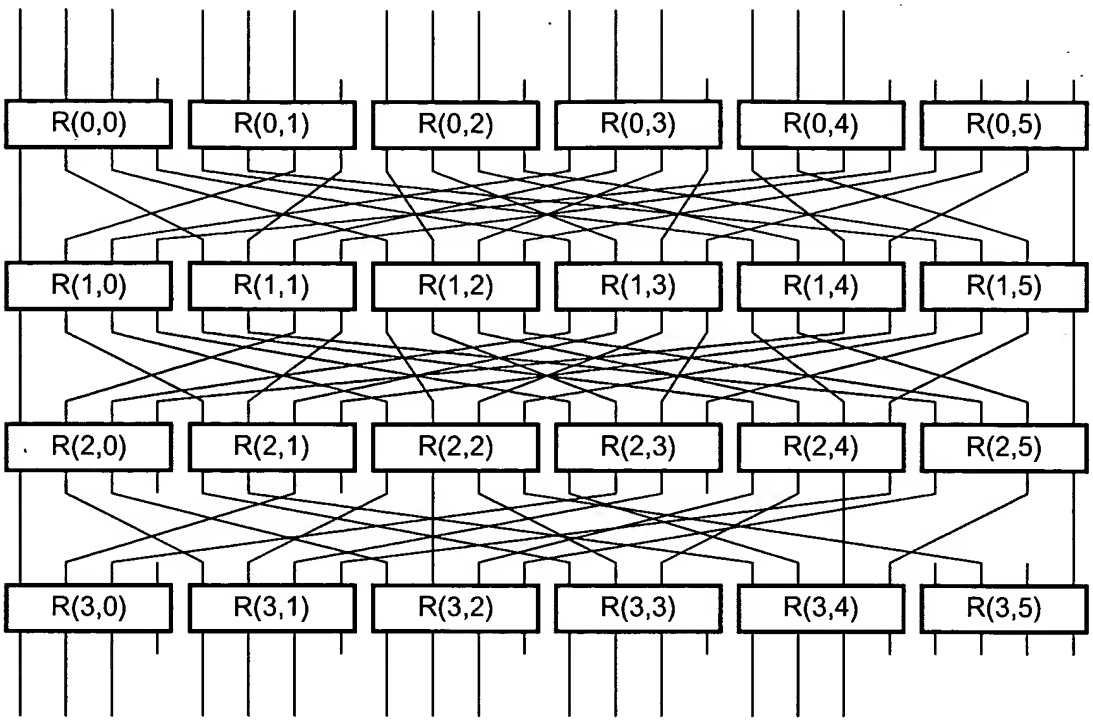


FIG. 72N

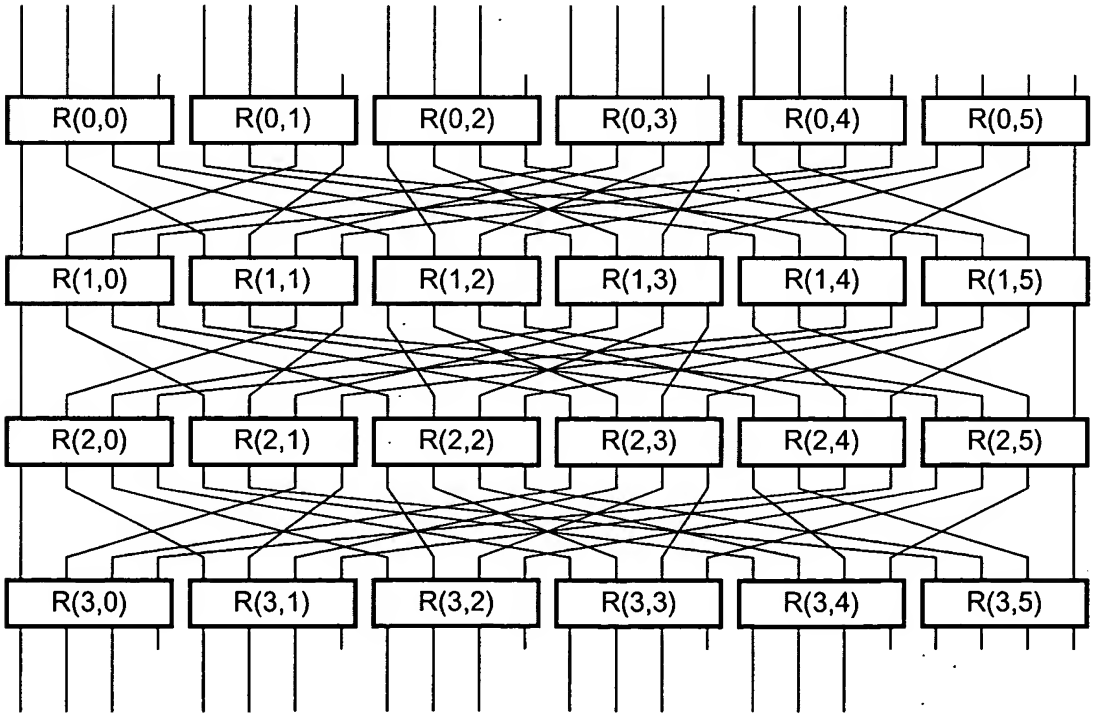
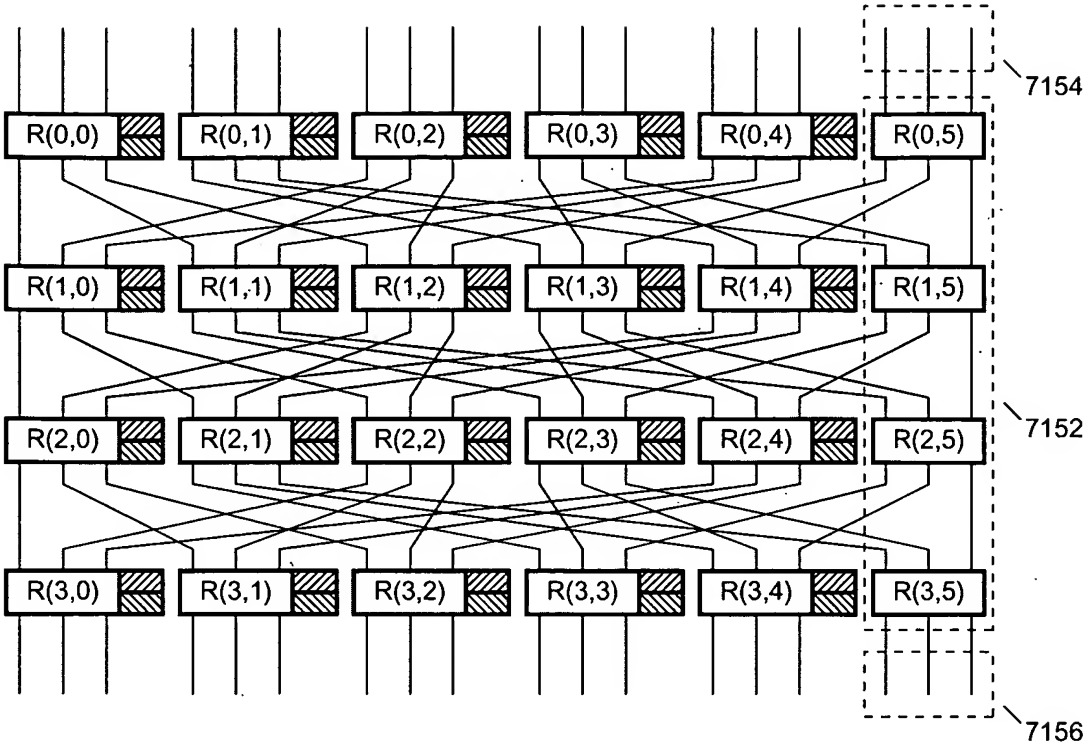


FIG. 72O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R(1,2)
R(1,3)
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R(2,2)
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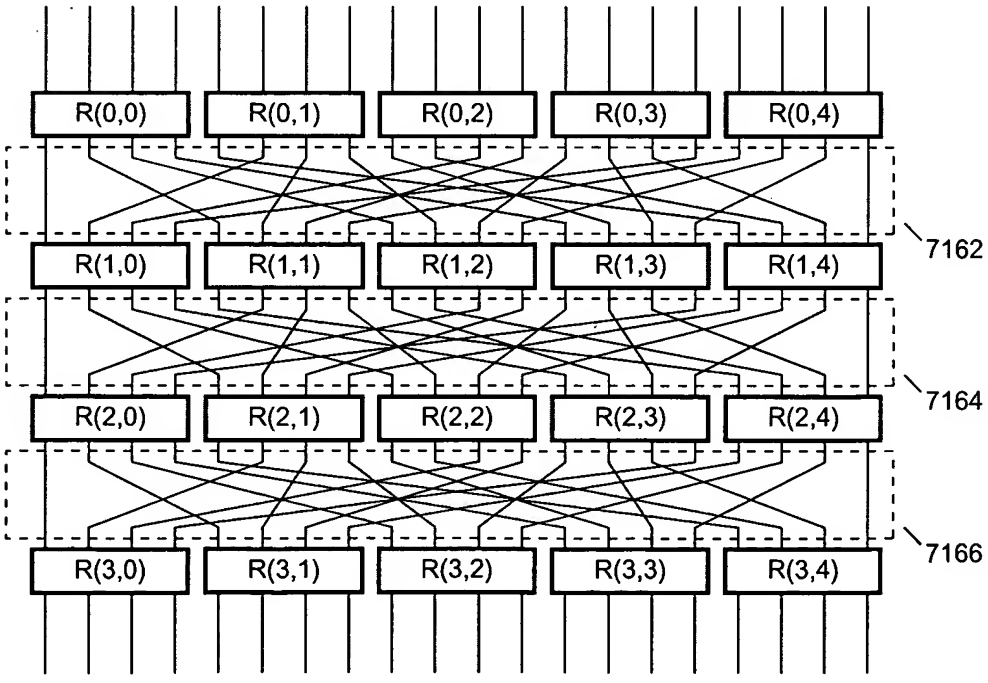
7154
7152
7156

FIG. 73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R(0,4)
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R(1,2)
R(1,3)
R(1,4)
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R(2,1)
R(2,2)
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R(2,4)
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7164
7166

FIG. 74

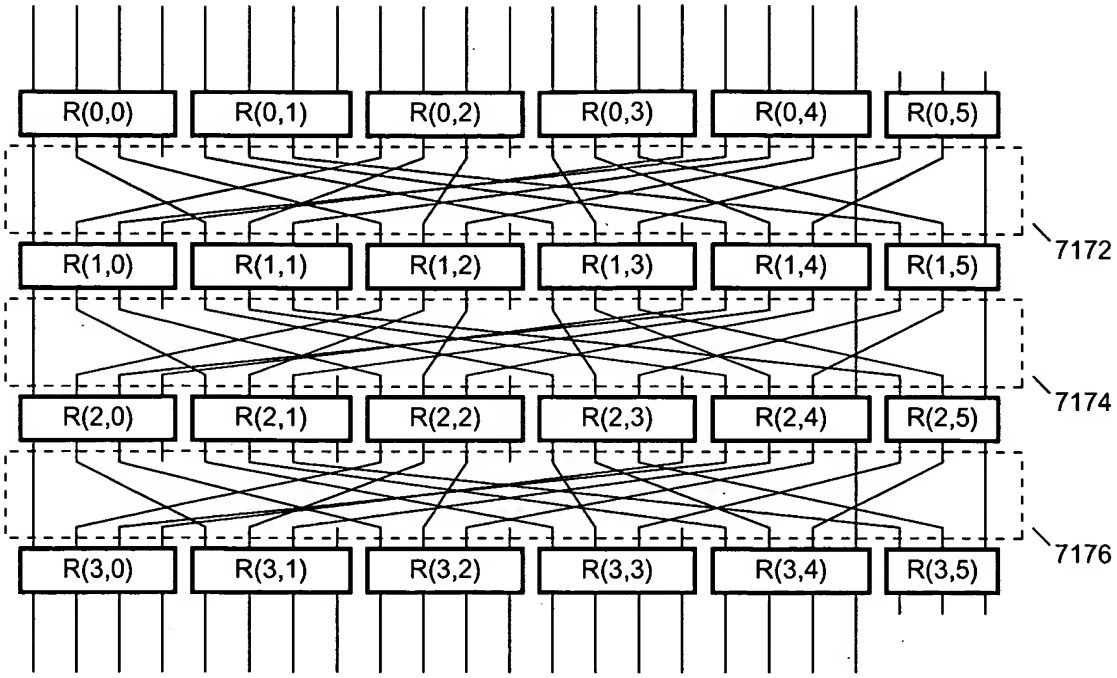


FIG. 75

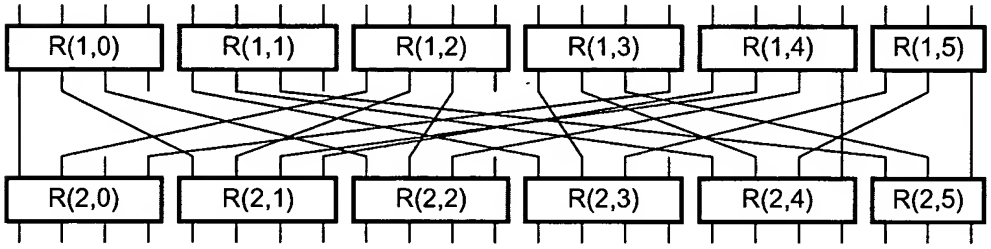


FIG. 76A

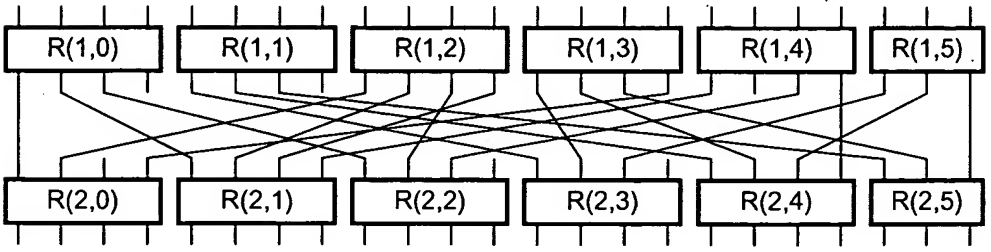


FIG. 76B

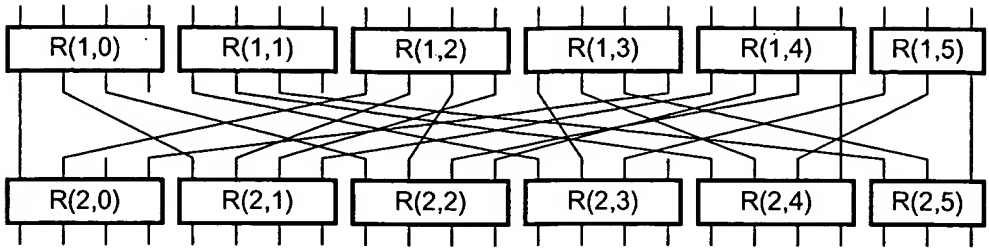


FIG. 76C

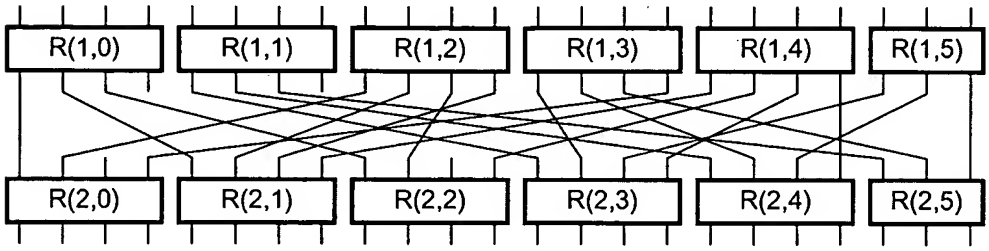


FIG. 76D

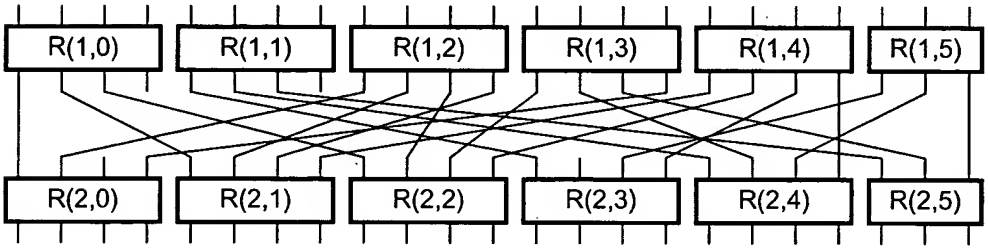


FIG. 76E

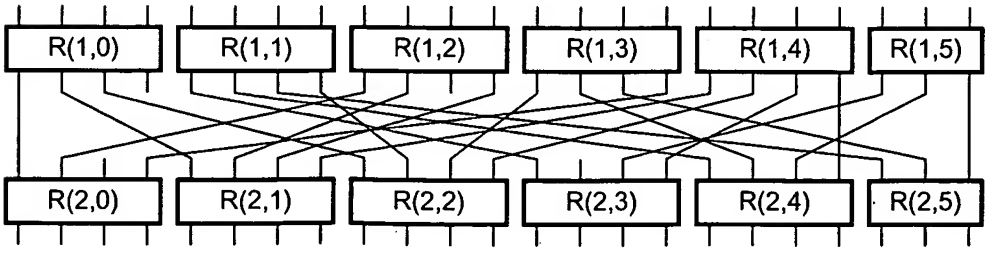


FIG. 76F

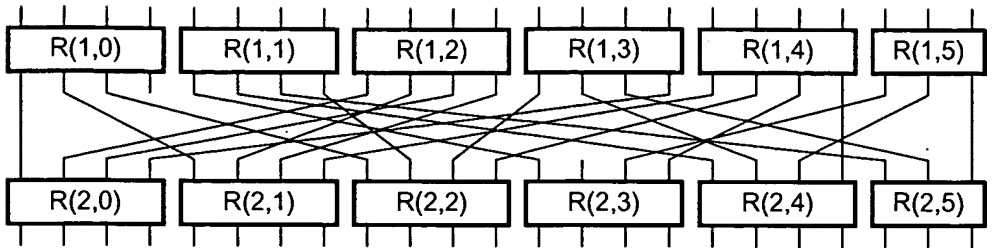


FIG. 76G

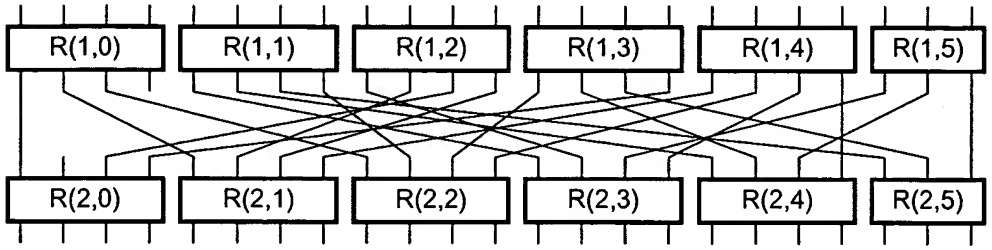


FIG. 76H

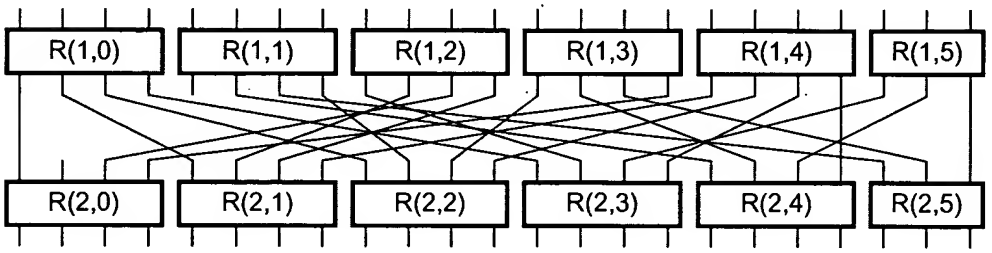


FIG. 76I

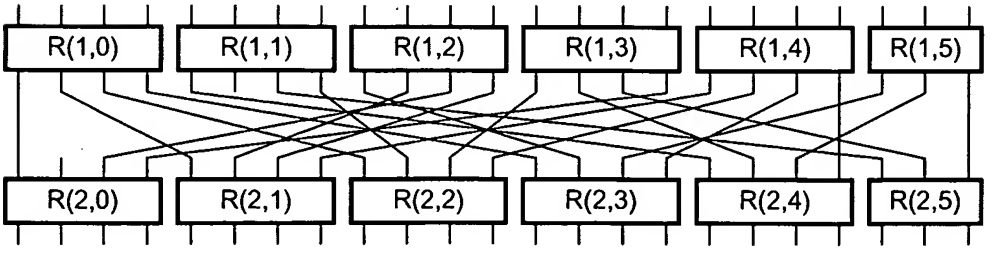


FIG. 76J

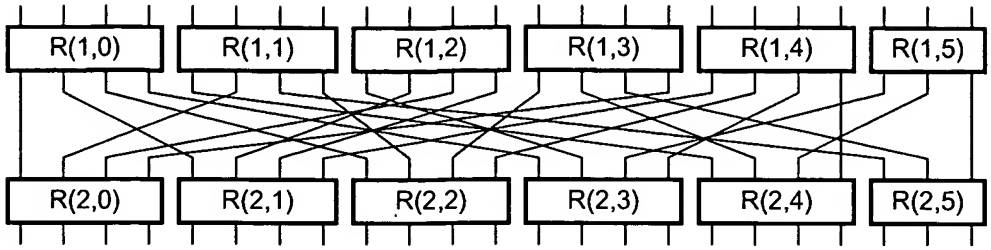


FIG. 76K

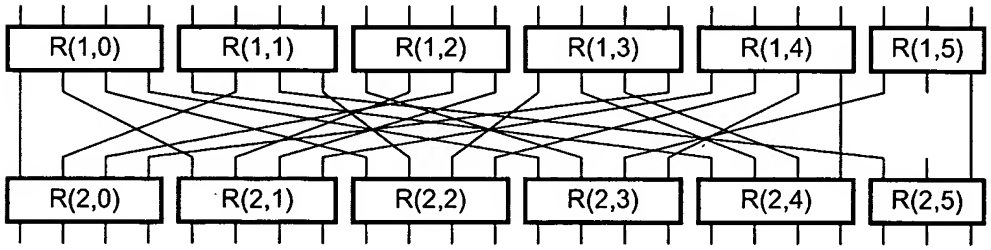


FIG. 76L

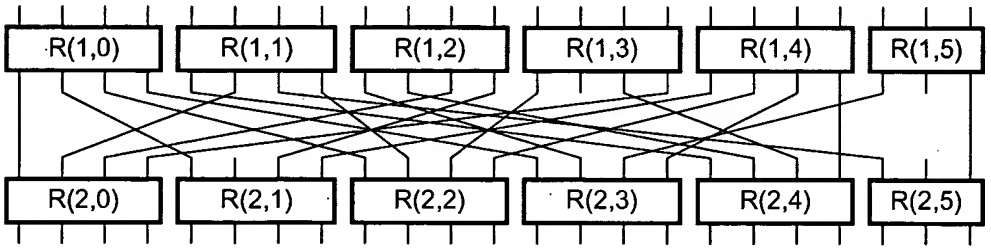


FIG. 76M

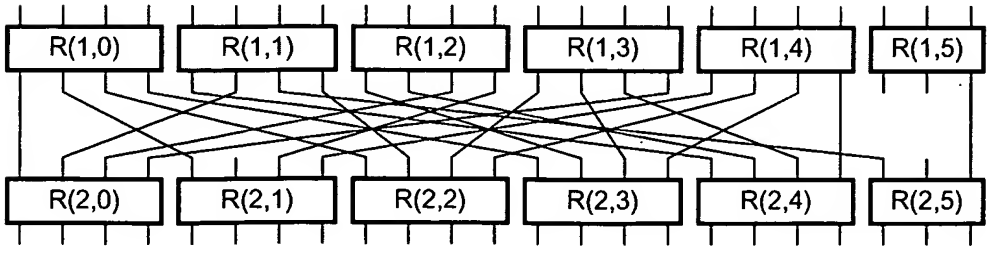


FIG. 76N

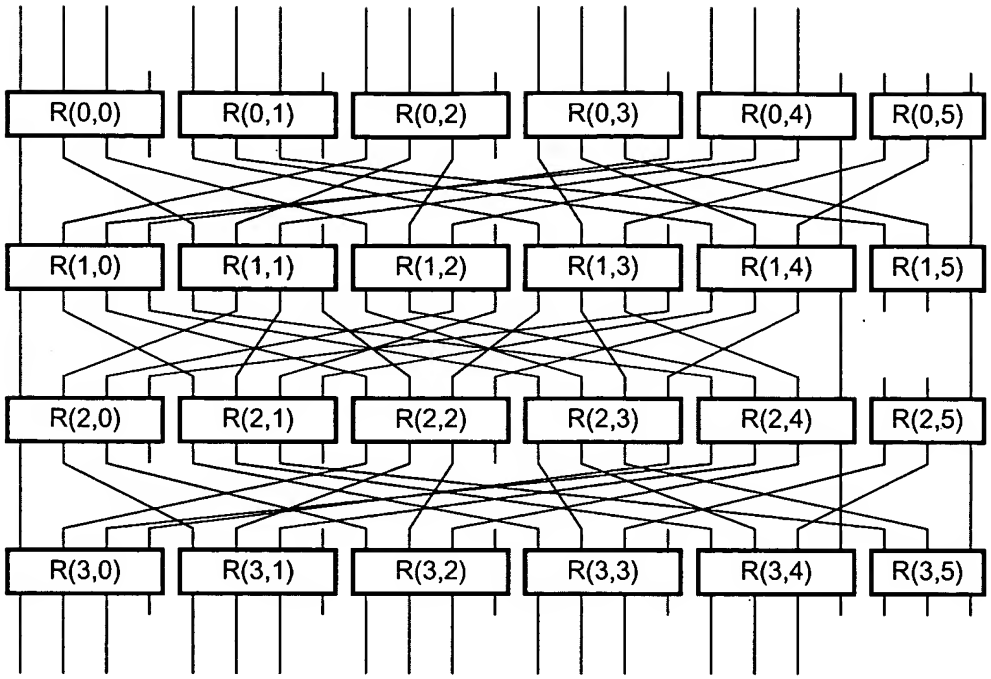


FIG. 76O

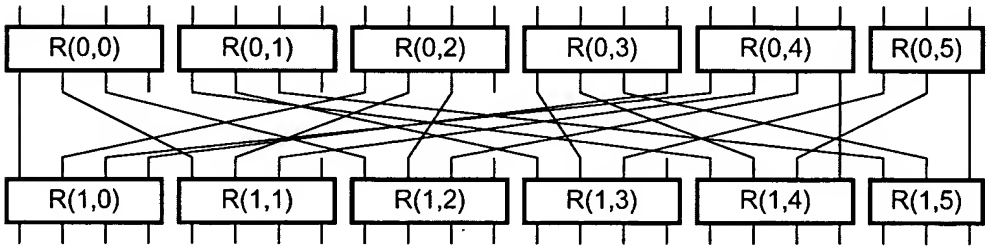


FIG. 77A

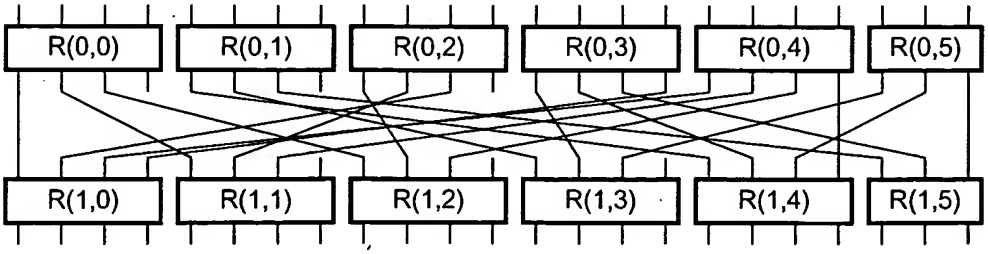


FIG. 77B

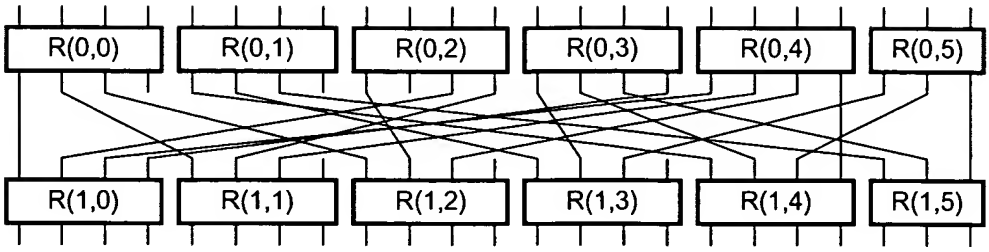


FIG. 77C

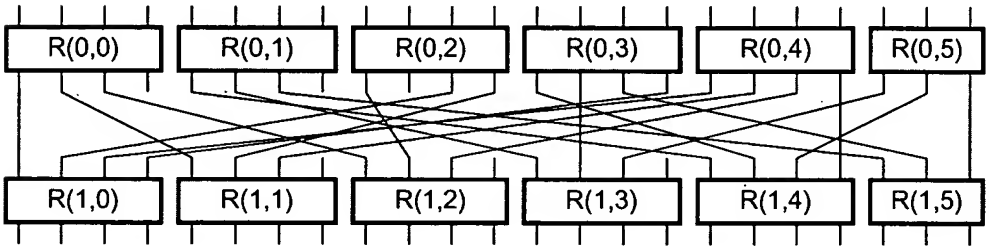


FIG. 77D

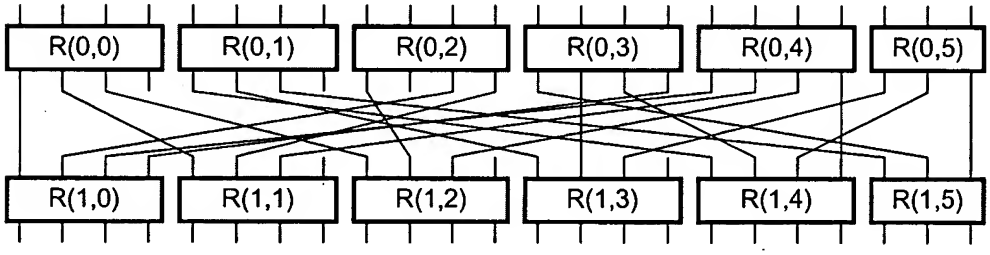


FIG. 77E

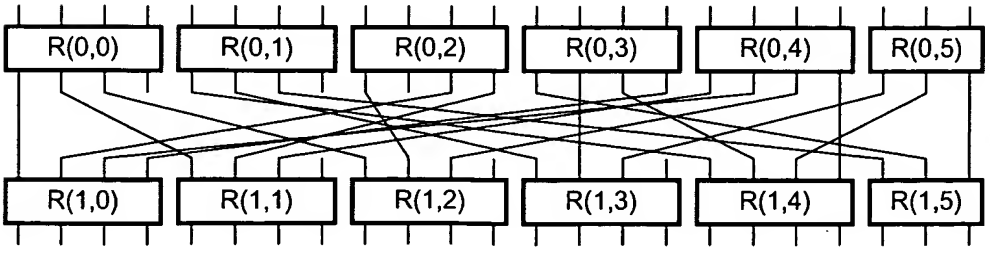


FIG. 77F

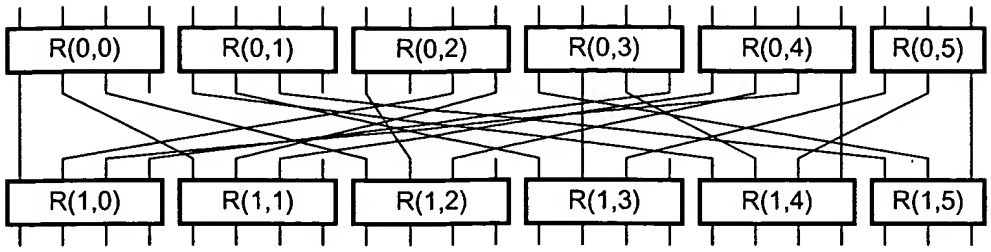


FIG. 77G

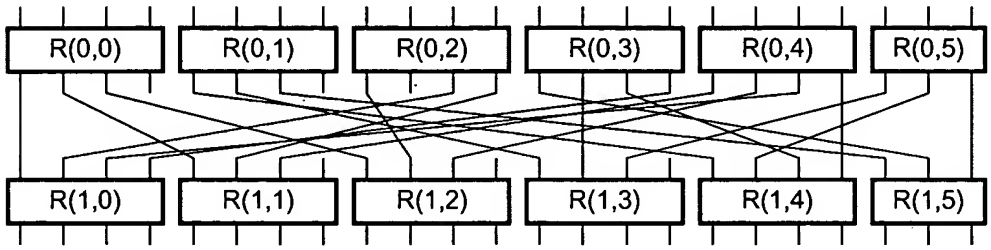


FIG. 77H

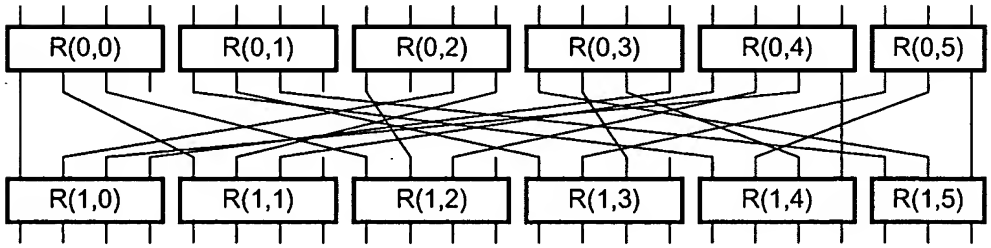


FIG. 77I

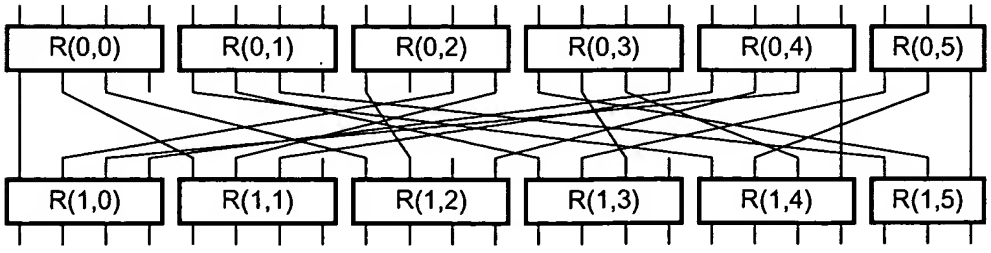


FIG. 77J

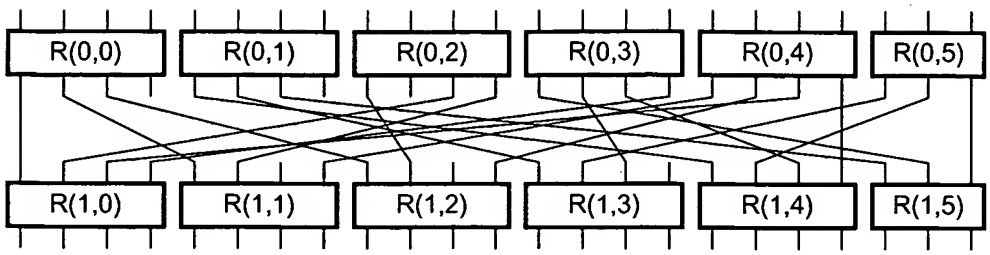


FIG. 77K

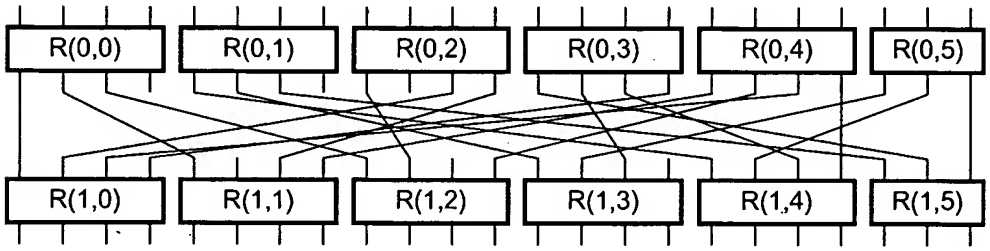


FIG. 77L

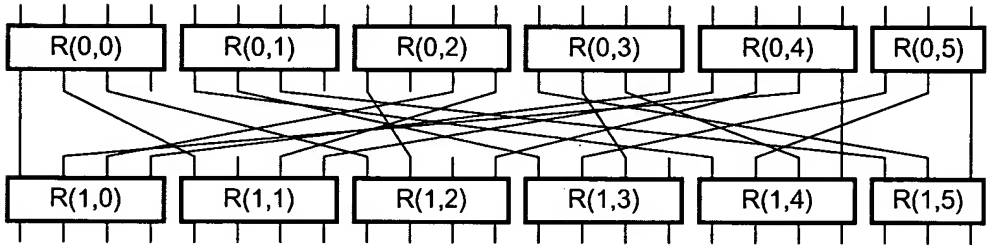


FIG. 77M

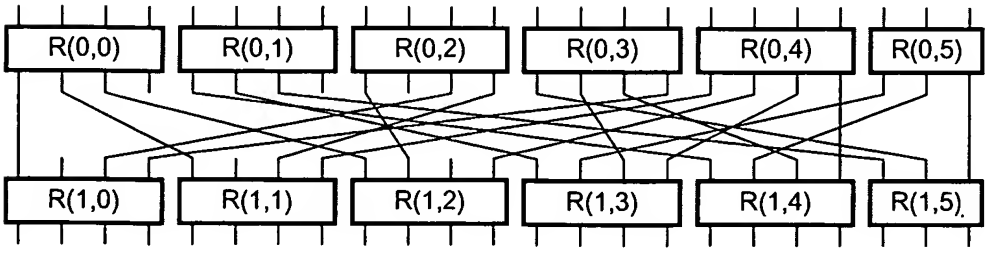


FIG. 77N

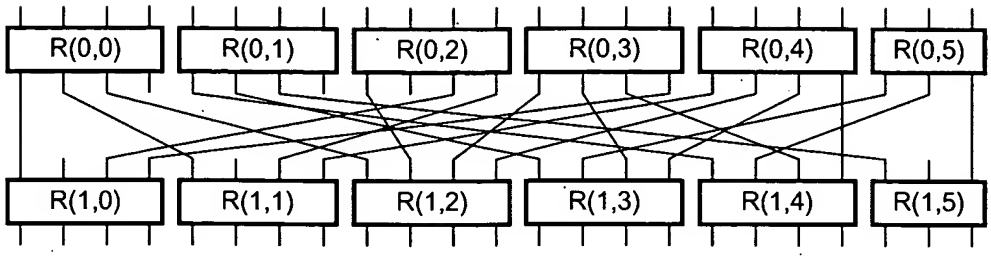


FIG. 77O

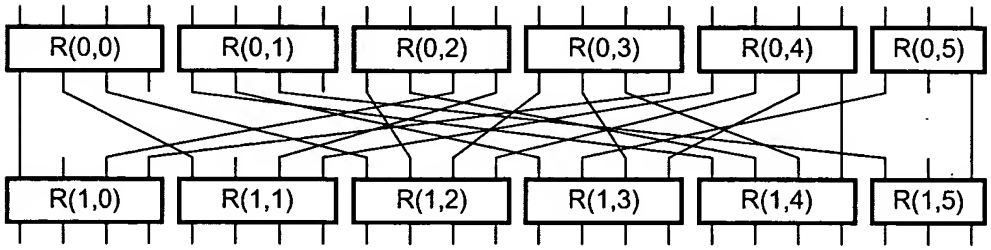


FIG. 77P

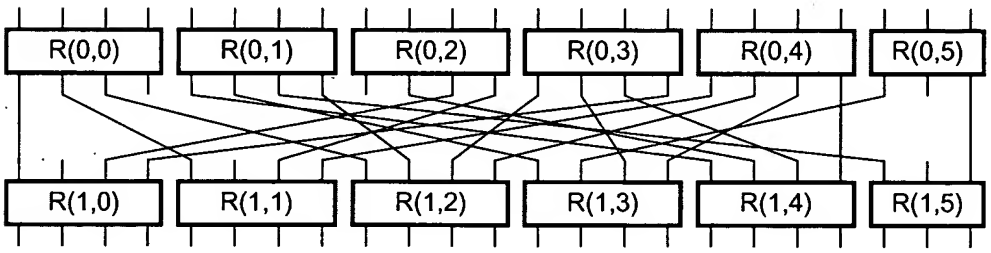


FIG. 77Q

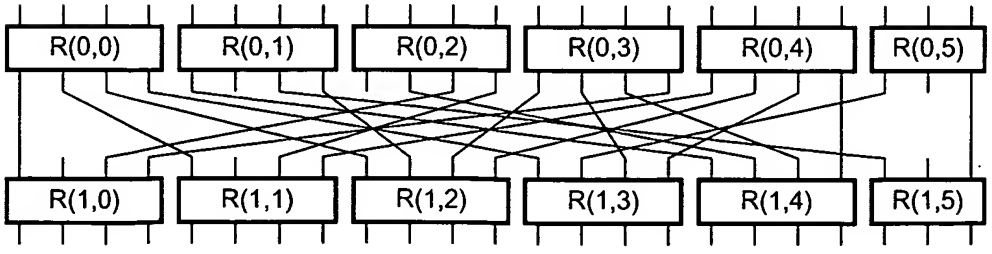


FIG. 77R

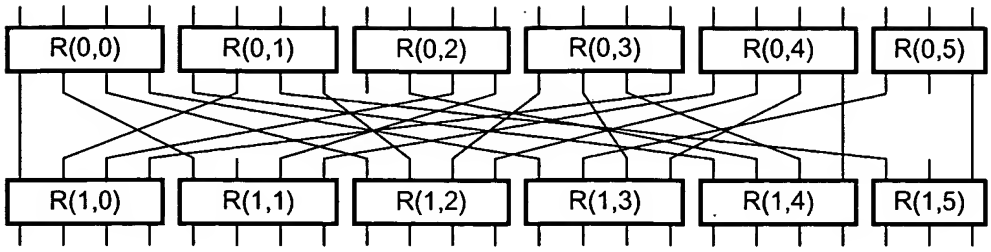


FIG. 77S

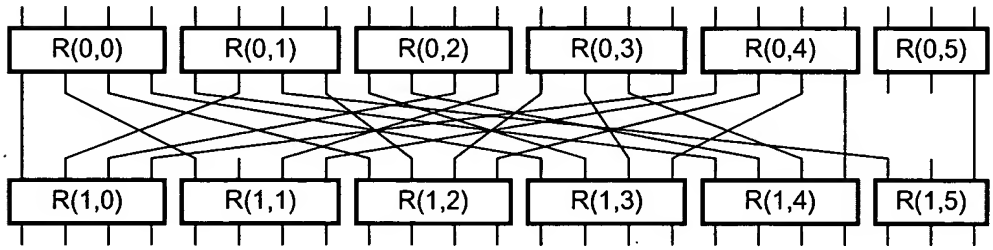


FIG. 77T

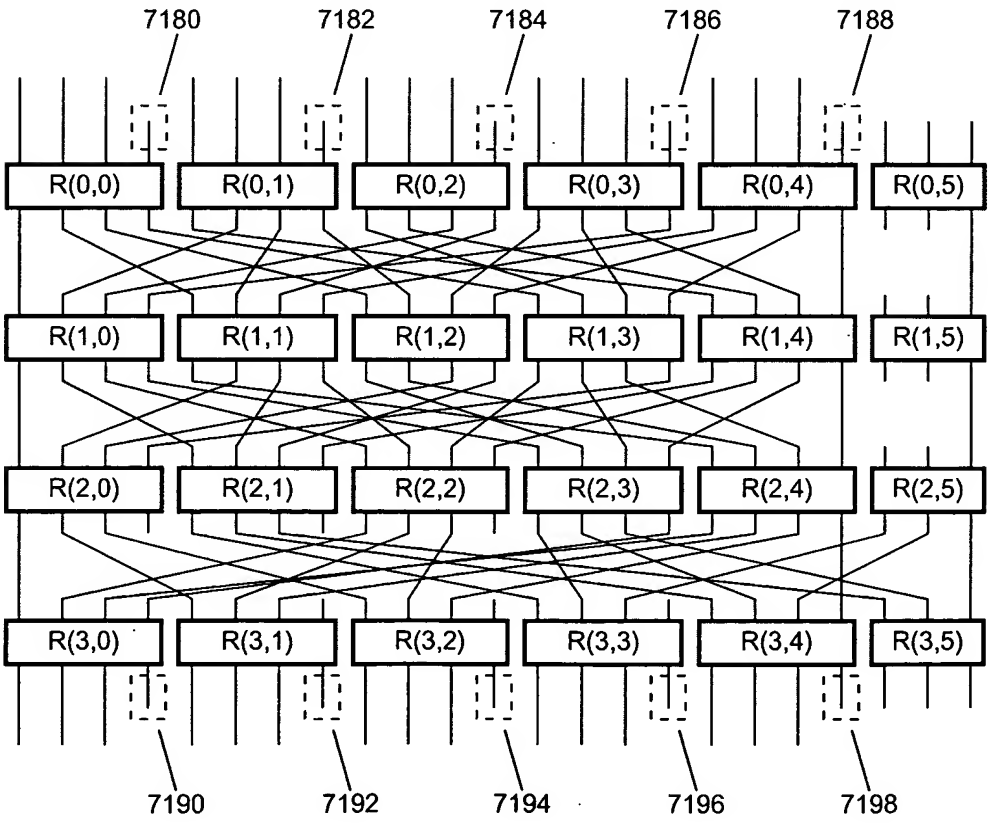
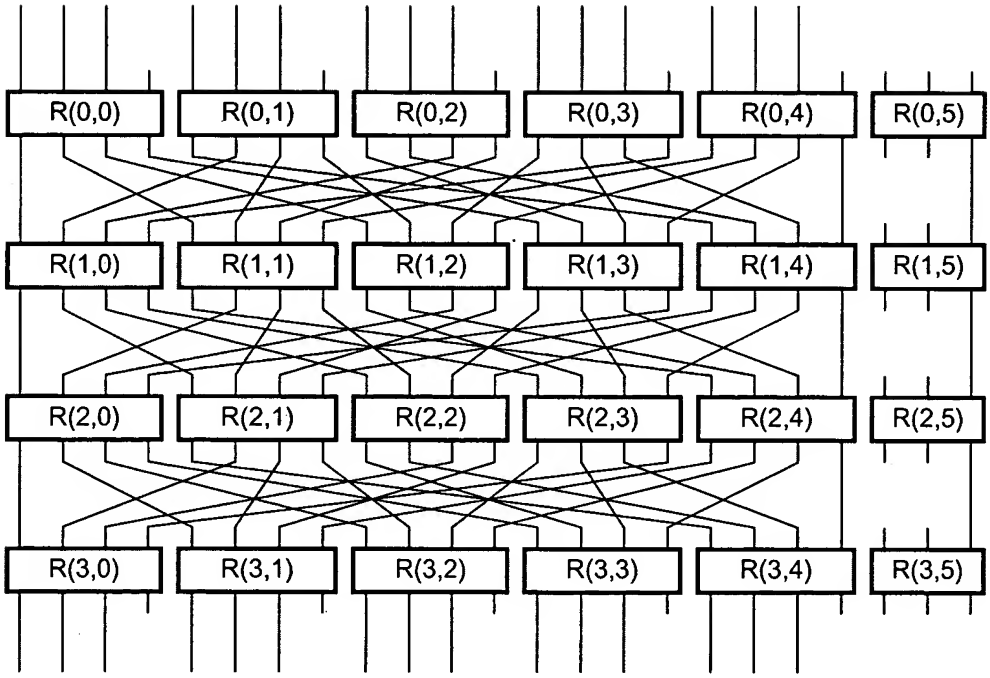


FIG. 77U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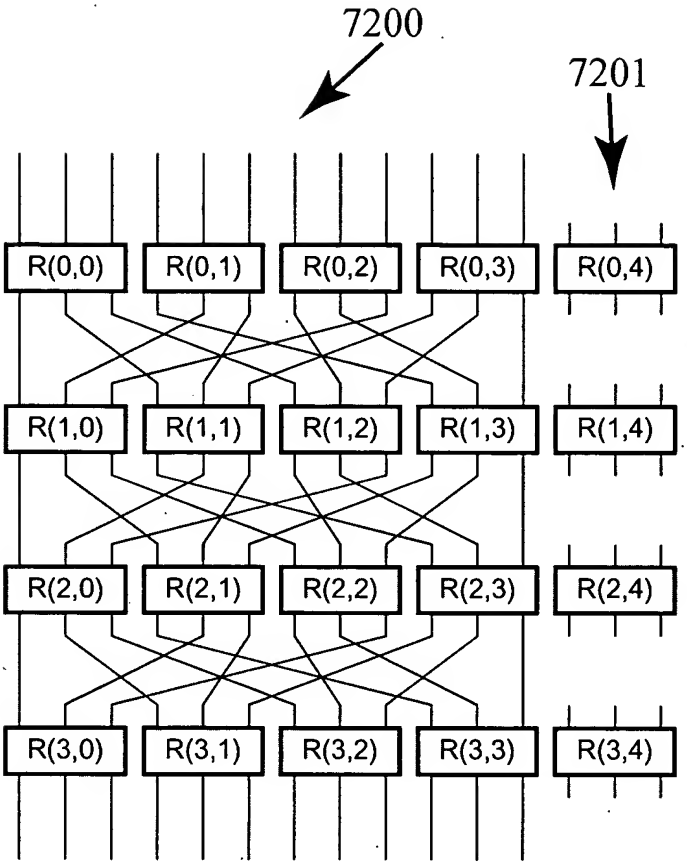
R(0,1)
R(0,2)
R(0,3)
R(0,4)
R(0,5)
R(1,0)
R(1,1)
R(1,2)
R(1,3)
R(1,4)
R(1,5)
R(2,0)
R(2,1)
R(2,2)
R(2,3)
R(2,4)
R(2,5)
R(3,0)
R(3,1)
R(3,2)
R(3,3)
R(3,4)
R(3,5)

FIG. 77V


7200
7201
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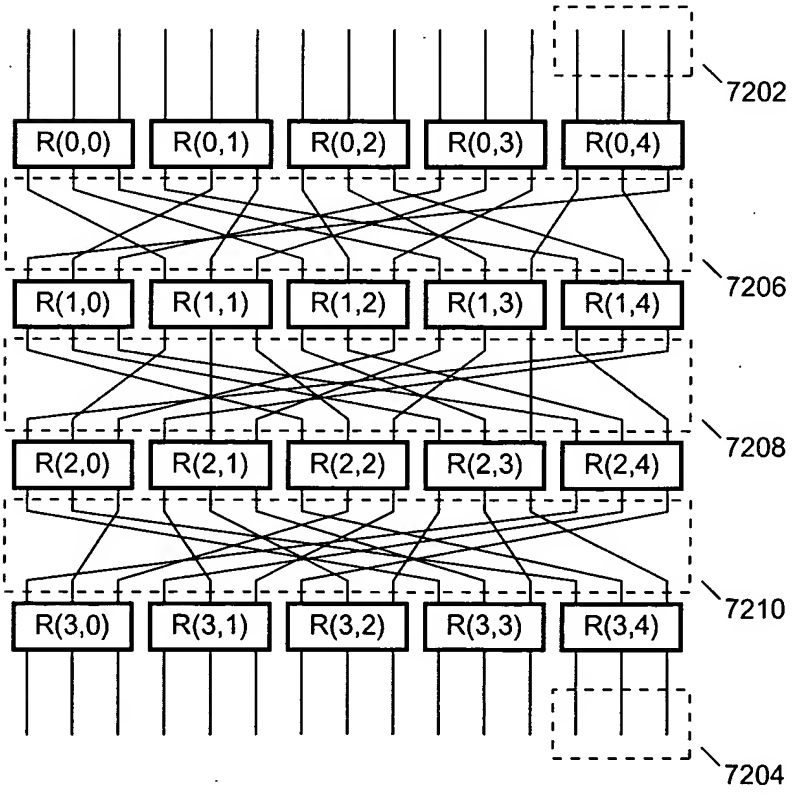
R(0,2)
R(0,3)
R(0,4)
R(1,0)
R(1,1)
R(1,2)
R(1,3)
R(1,4)
R(2,0)
R(2,1)
R(2,2)
R(2,3)
R(2,4)
R(3,0)
R(3,1)
R(3,2)
R(3,3)
R(3,4)

FIG. 78


7202
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R(0,3)
R(0,4)
7206
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R(1,1)
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R(1,3)
R(1,4)
7208
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R(2,1)
R(2,2)
R(2,3)
R(2,4)
7210
R(3,0)
R(3,1)
R(3,2)
R(3,3)
R(3,4)
7204

FIG. 79

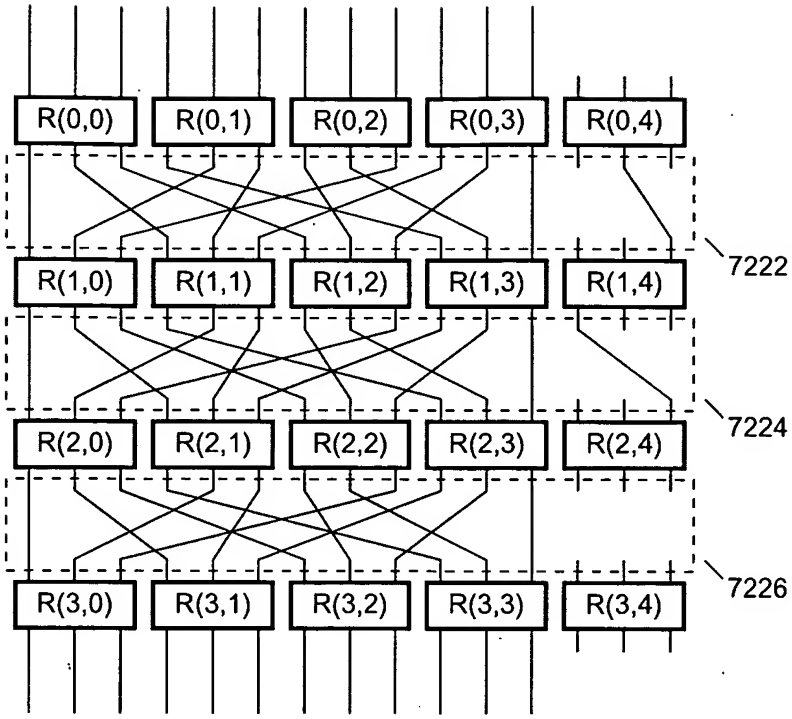


FIG. 80

FIG. 81A

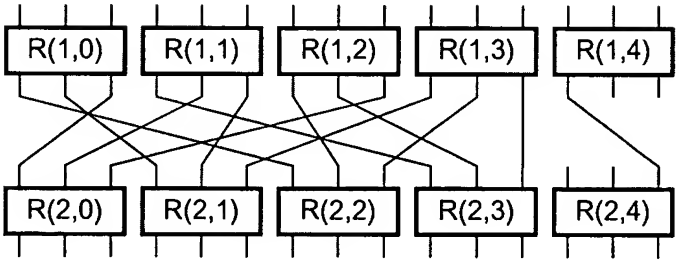


FIG. 81B

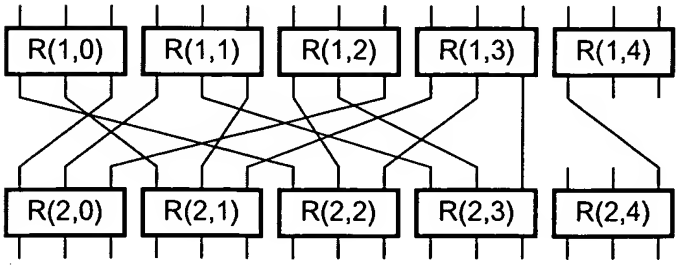


FIG. 81C

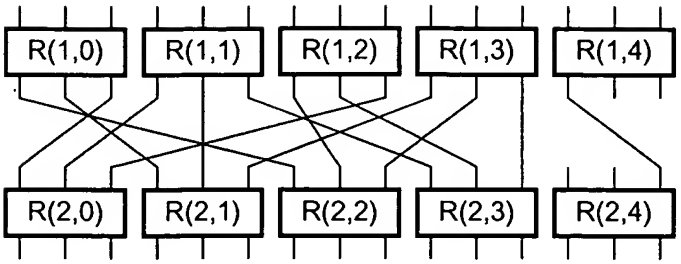


FIG. 81D

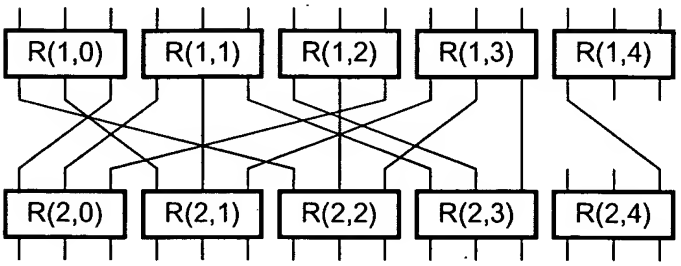


FIG. 81E

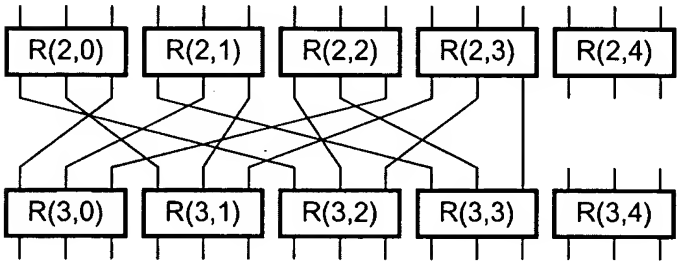


FIG. 81F

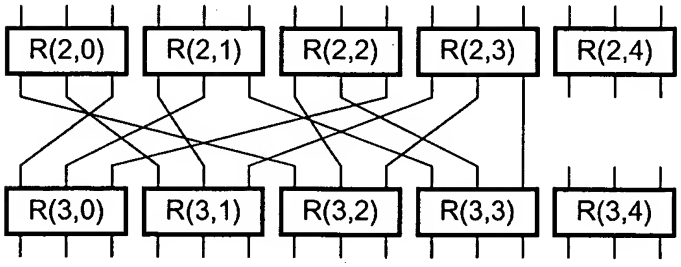


FIG. 81G

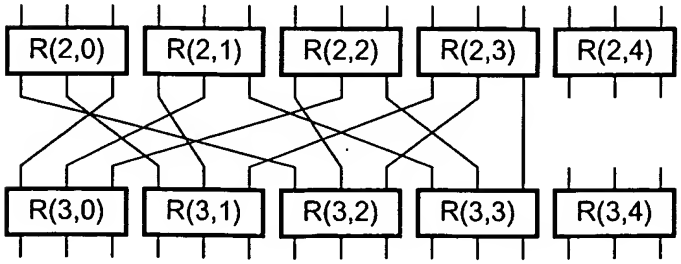


FIG. 81H

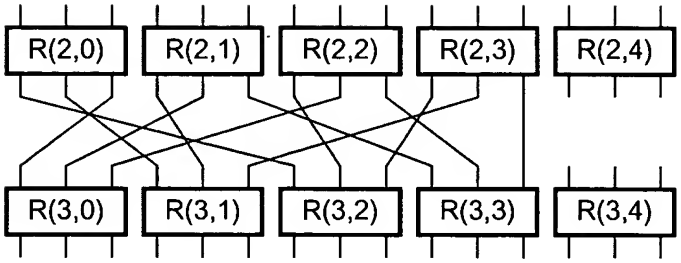


FIG. 81I

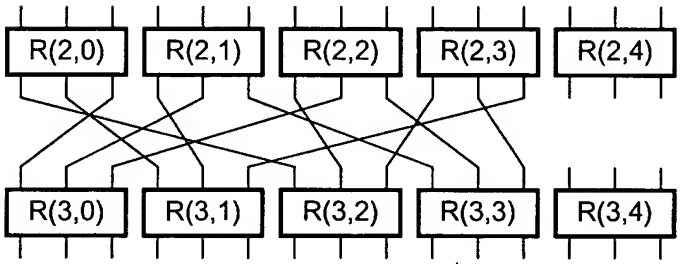


FIG. 81J

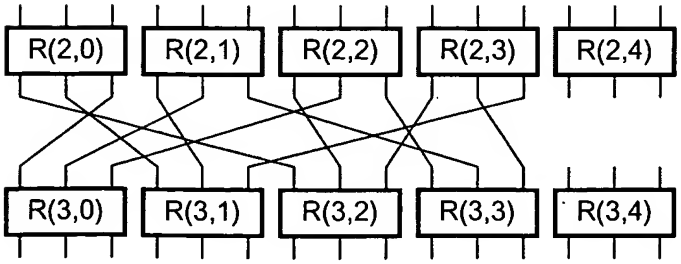


FIG. 81K

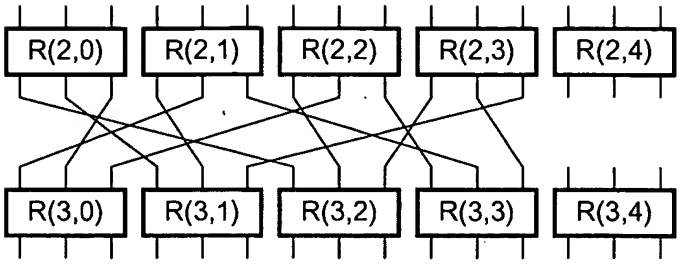
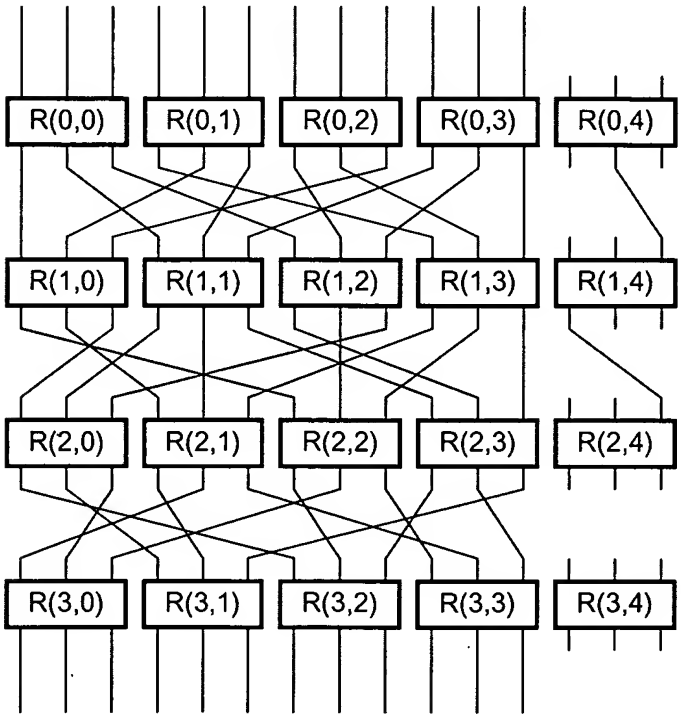


FIG. 81L



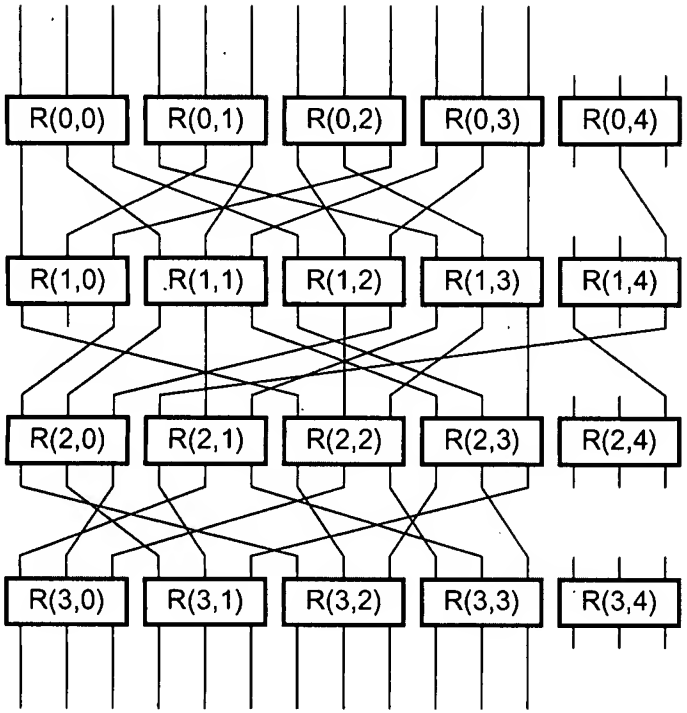


FIG. 82A

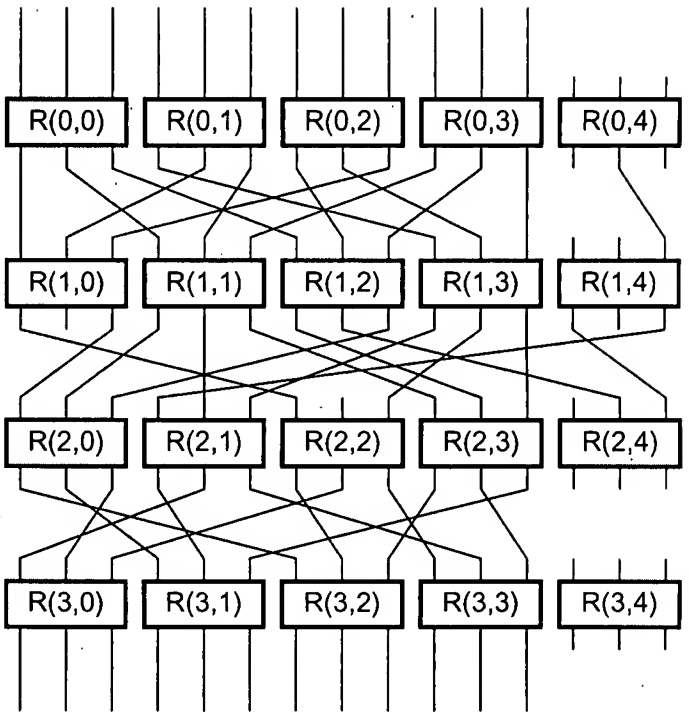


FIG. 82B

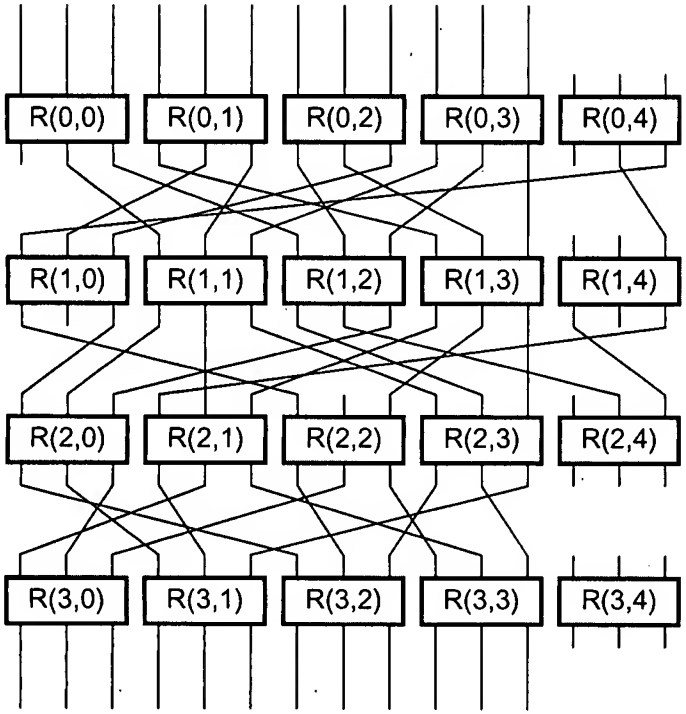


FIG. 82C

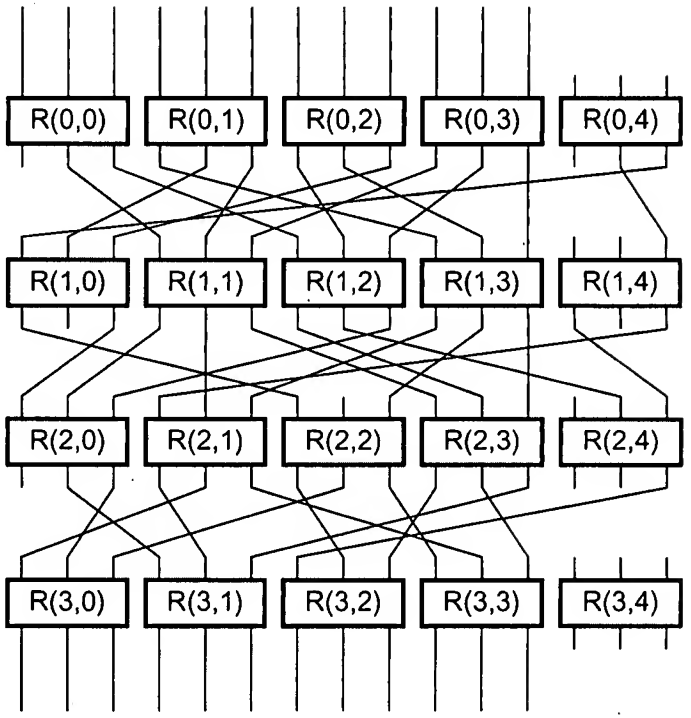


FIG. 82D

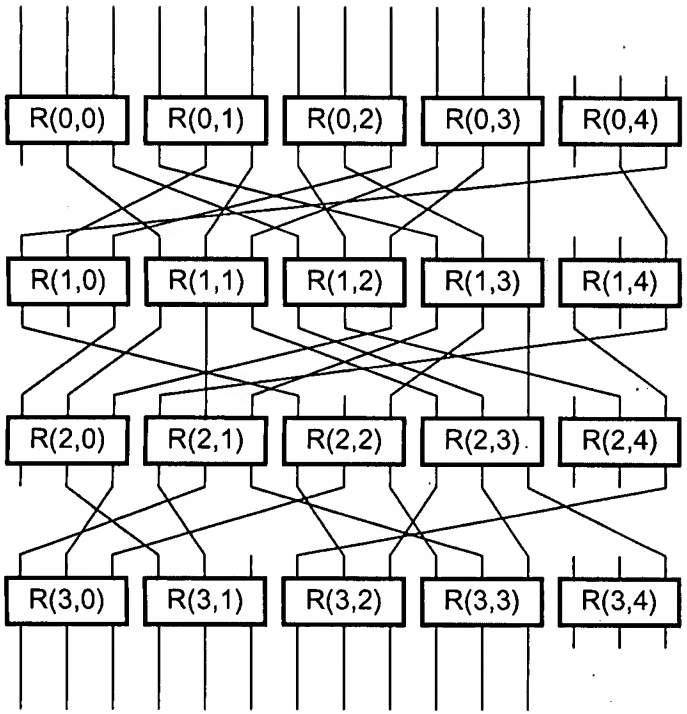


FIG. 82E

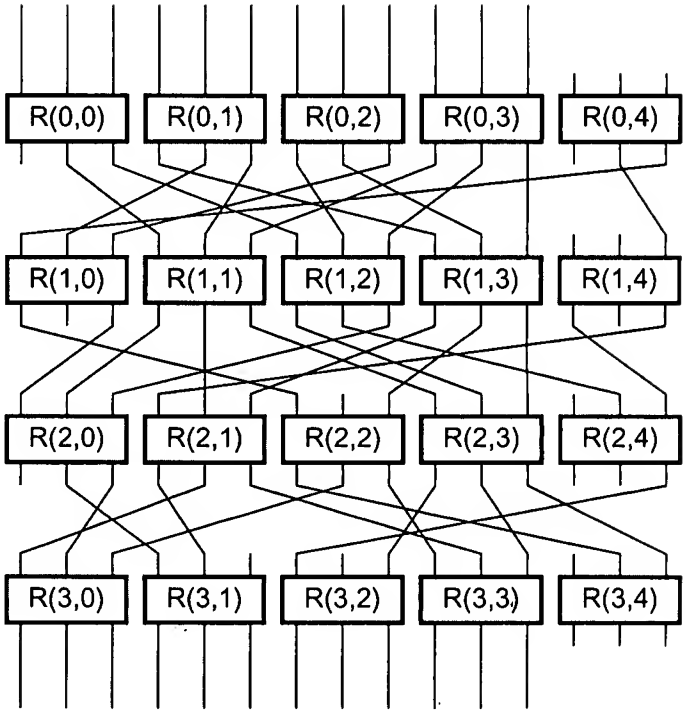


FIG. 82F

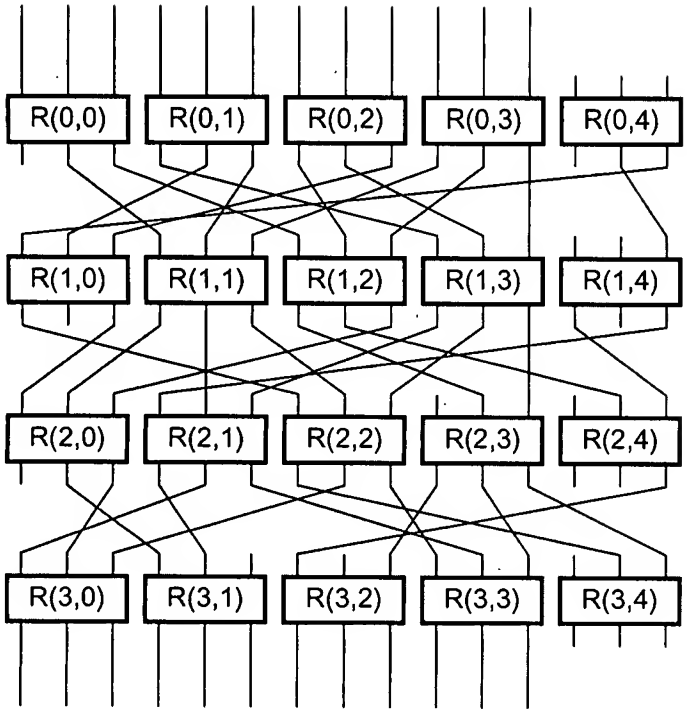


FIG. 82G

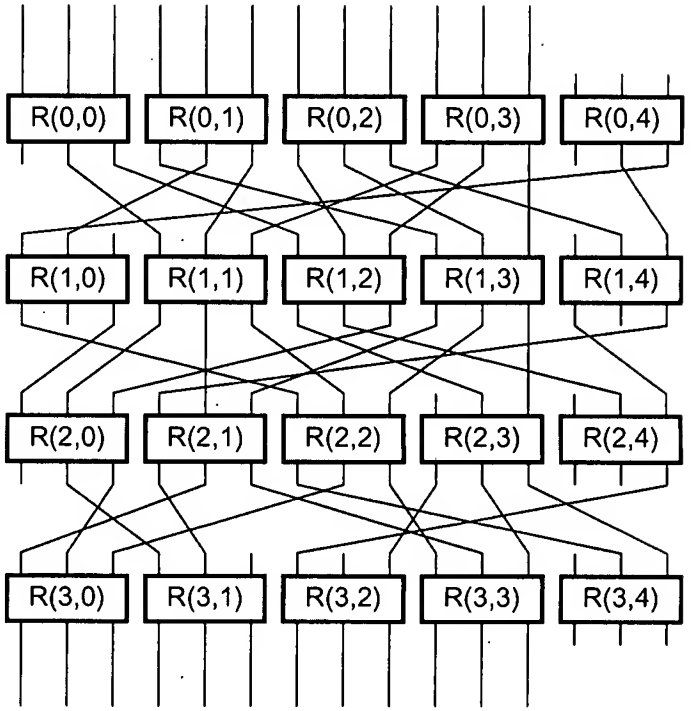


FIG. 82H

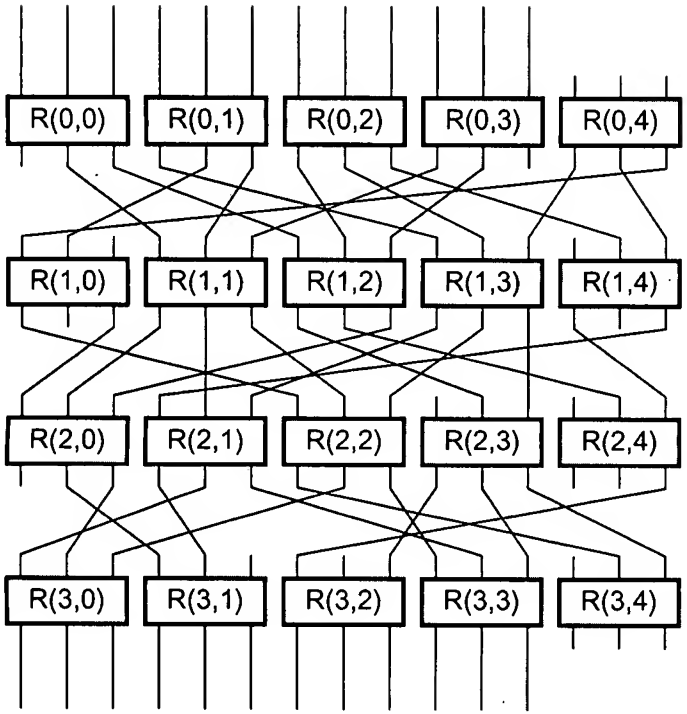


FIG. 82I

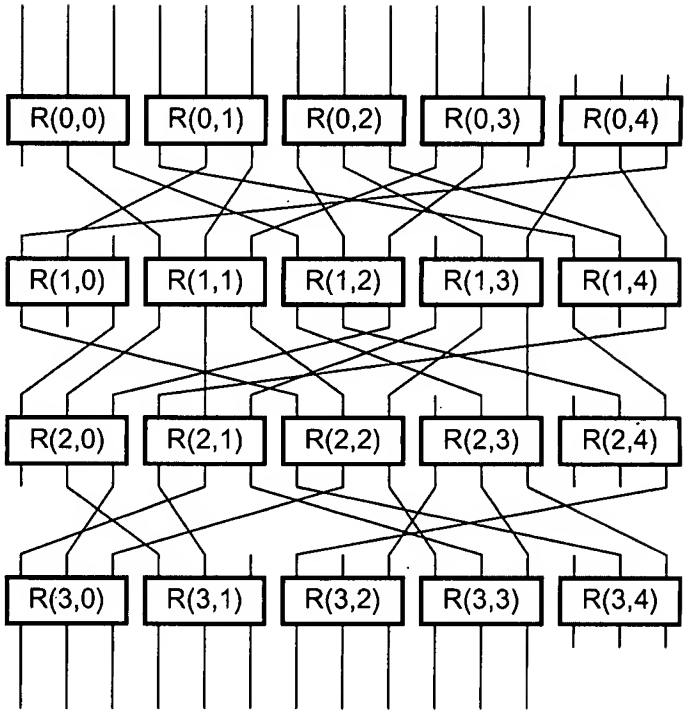


FIG. 82J

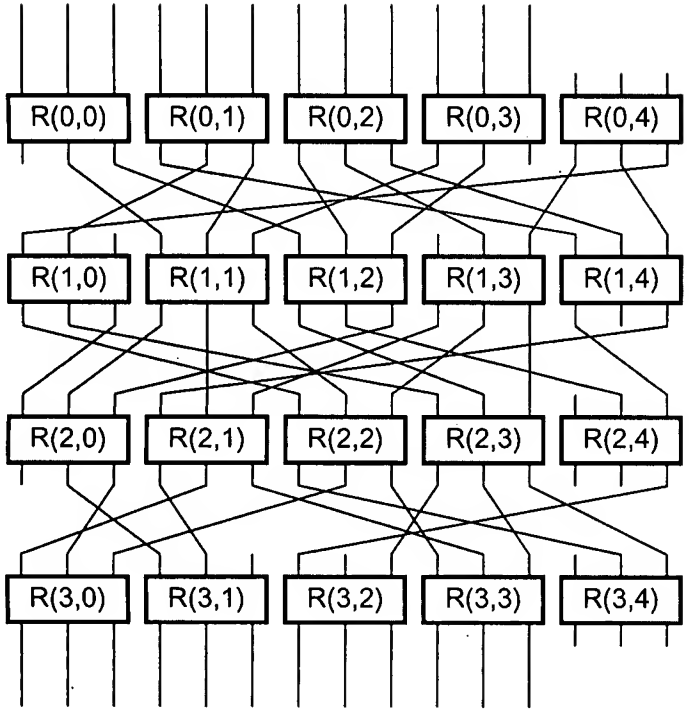


FIG. 82K

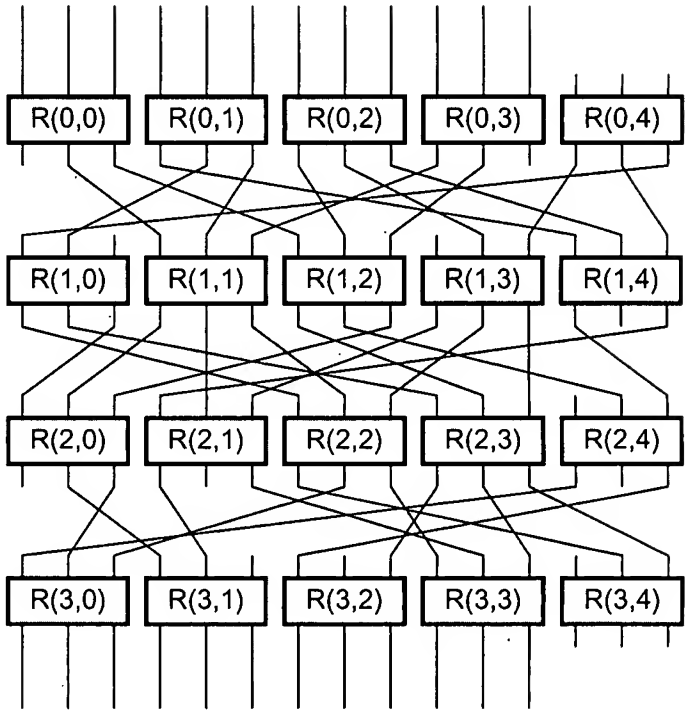


FIG. 82L

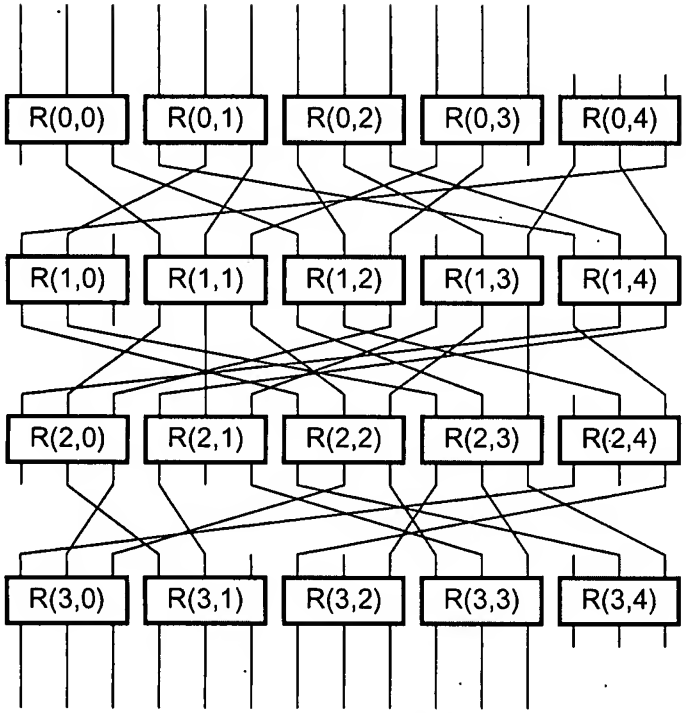


FIG. 82M

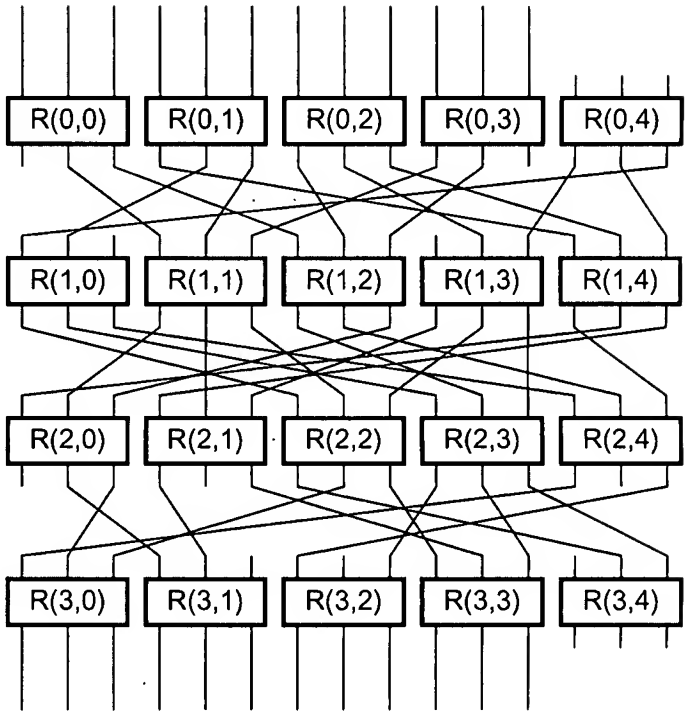


FIG. 82N

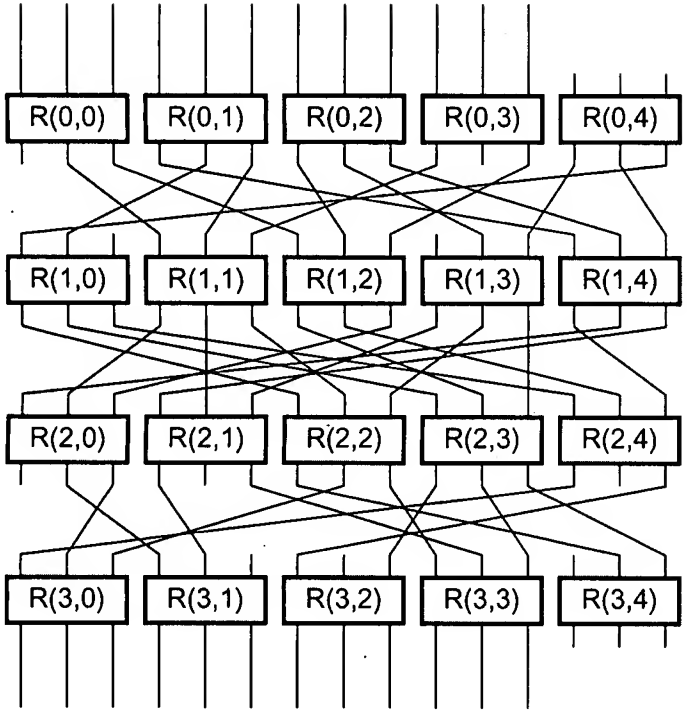


FIG. 82O

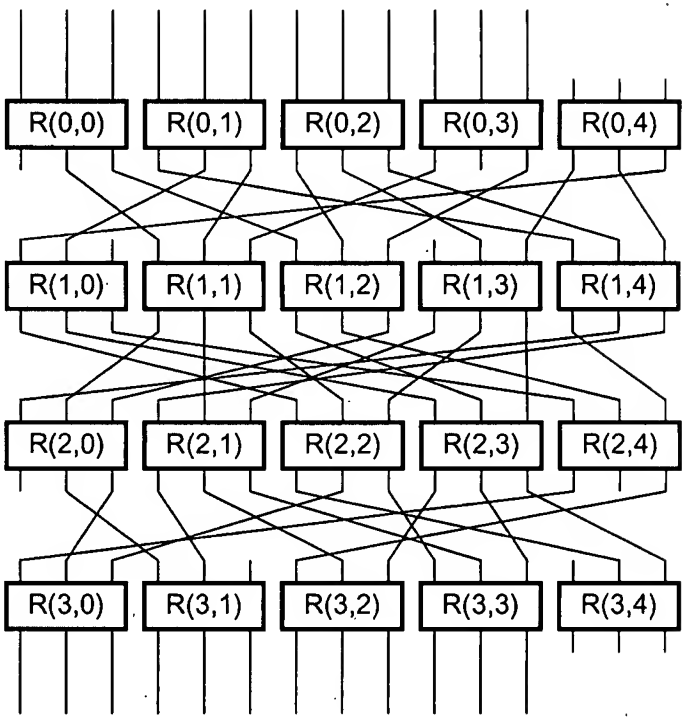


FIG. 82P

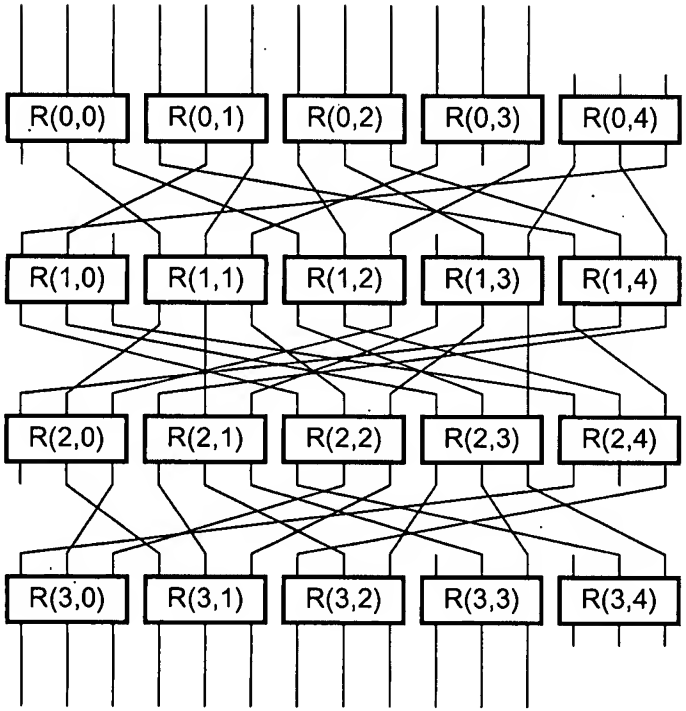


FIG. 82Q

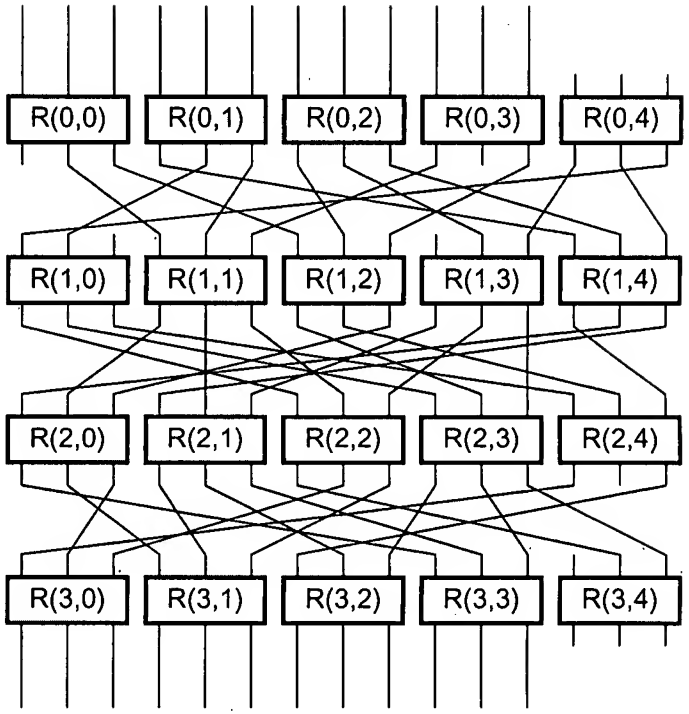


FIG. 82R

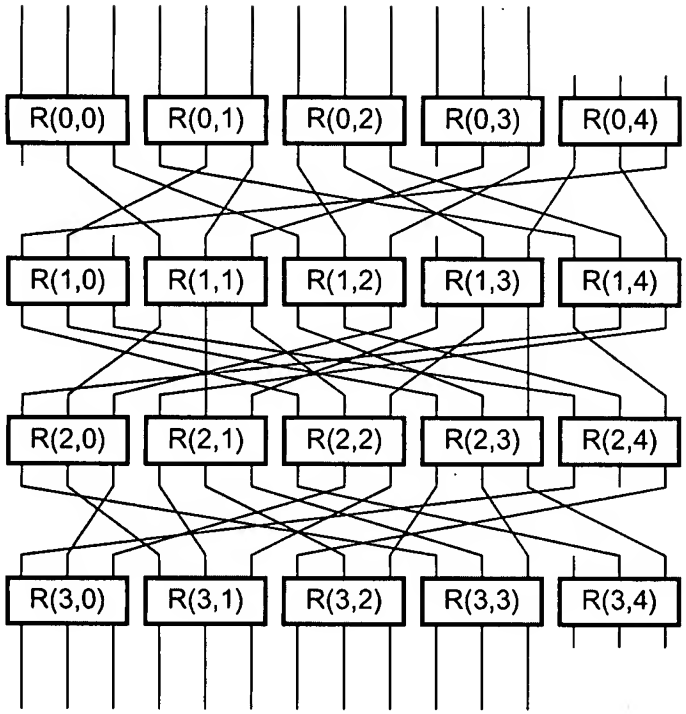


FIG. 82S

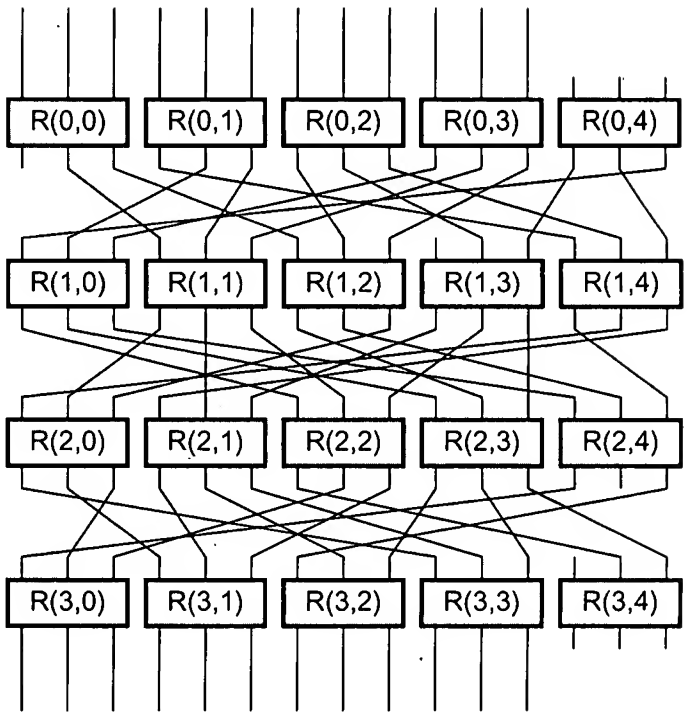


FIG. 82T

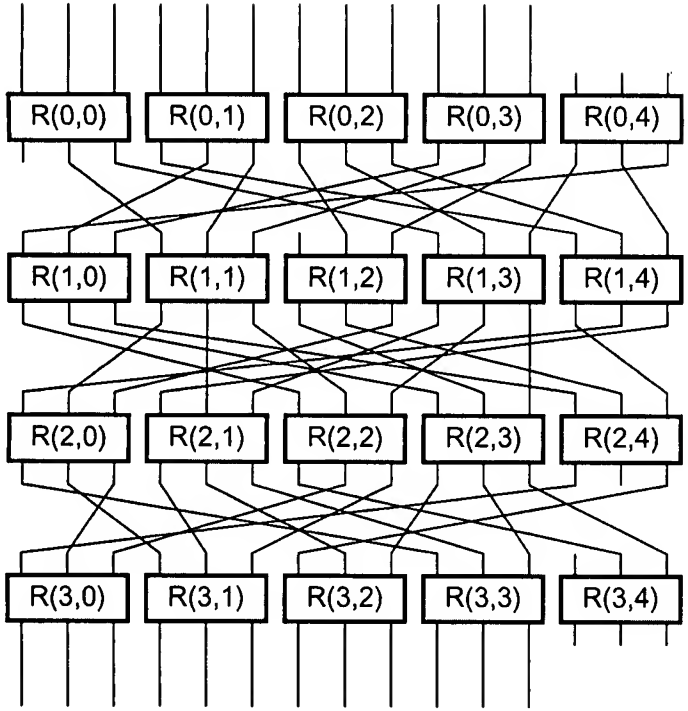


FIG. 82U

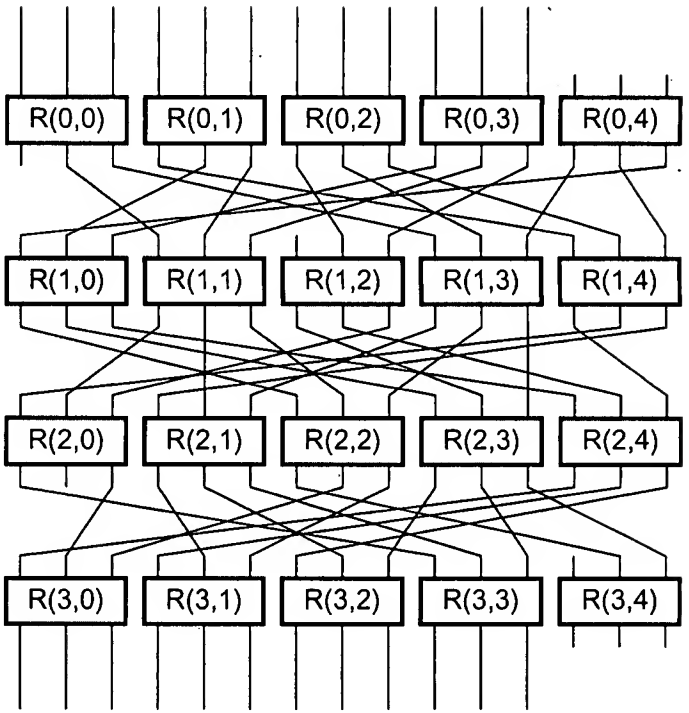


FIG. 82V

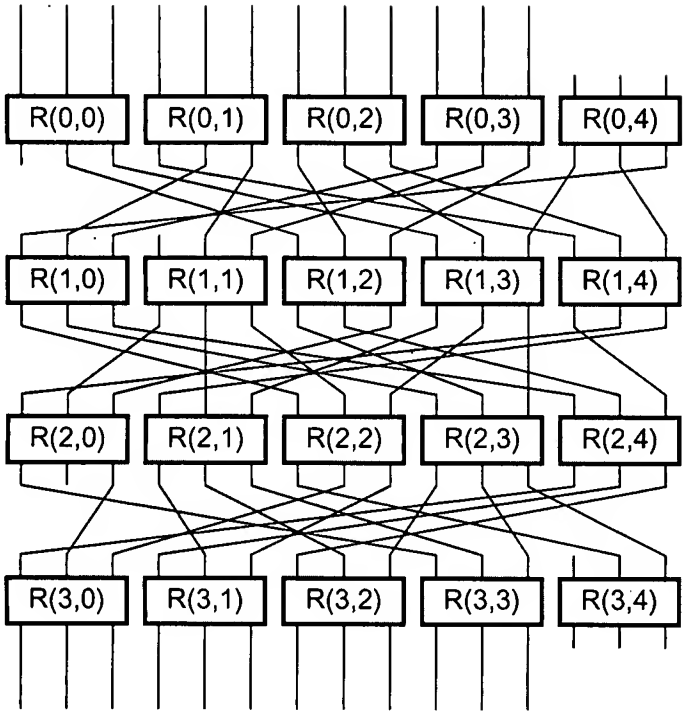


FIG. 82W

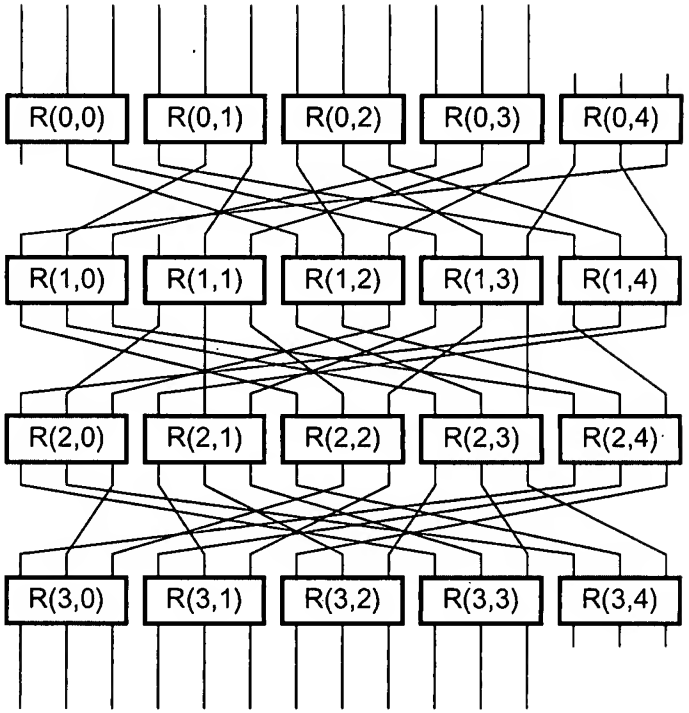
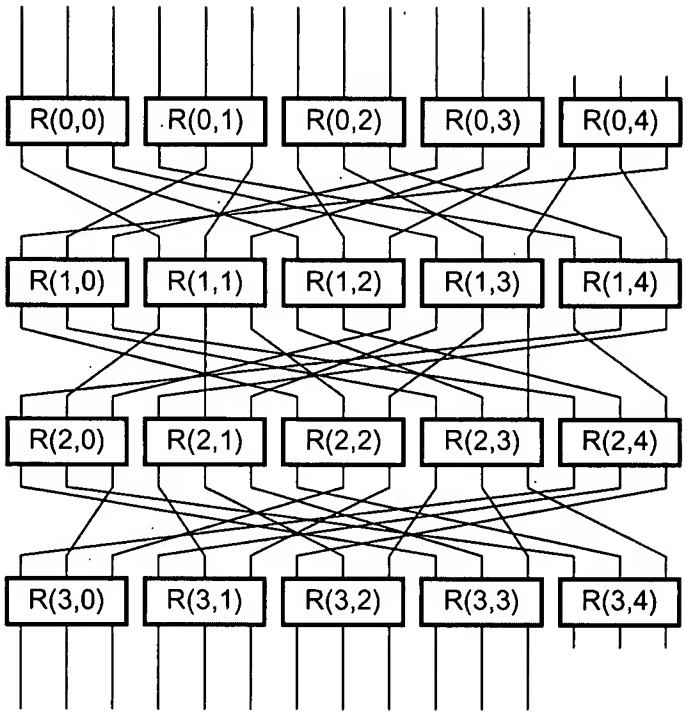


FIG. 82X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R(1,4)
R(2,0)
R(2,1)
R(2,2)
R(2,3)
R(2,4)
R(3,0)
R(3,1)
R(3,2)
R(3,3)
R(3,4)

FIG. 82Y

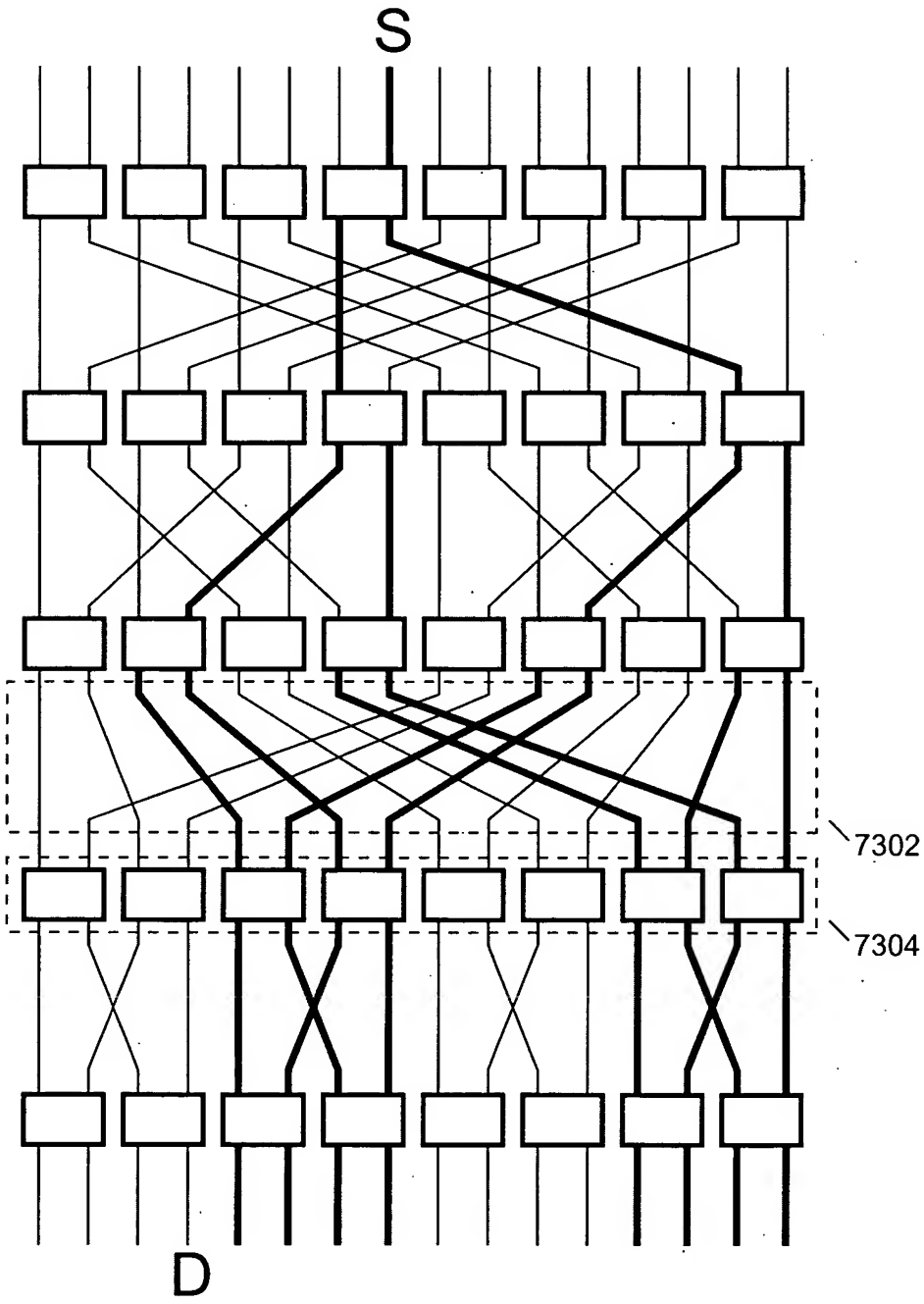

FIG. 83

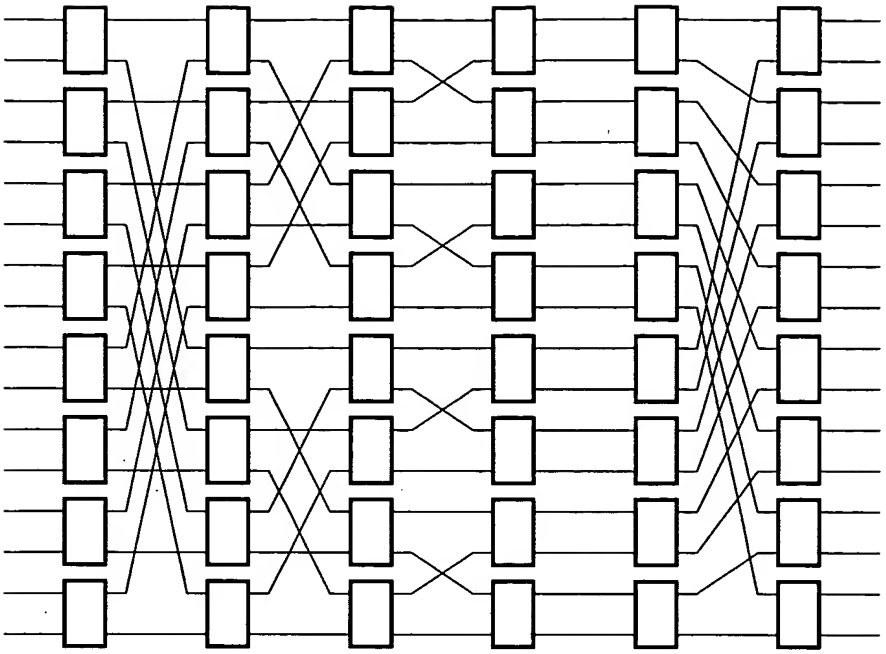

FIG. 84B

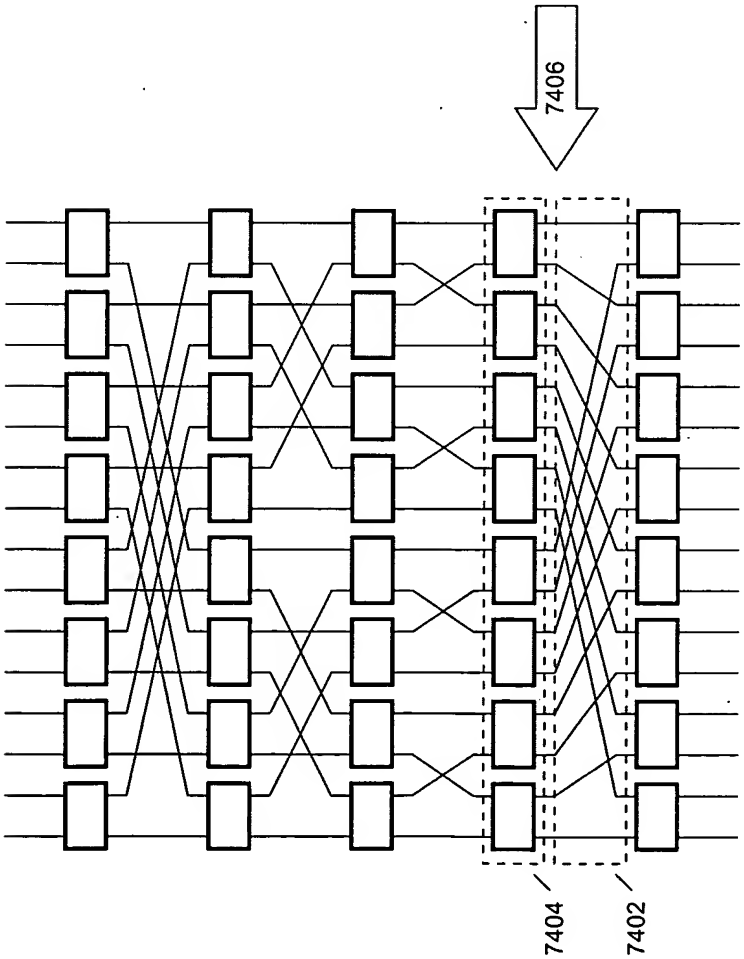

FIG. 84A

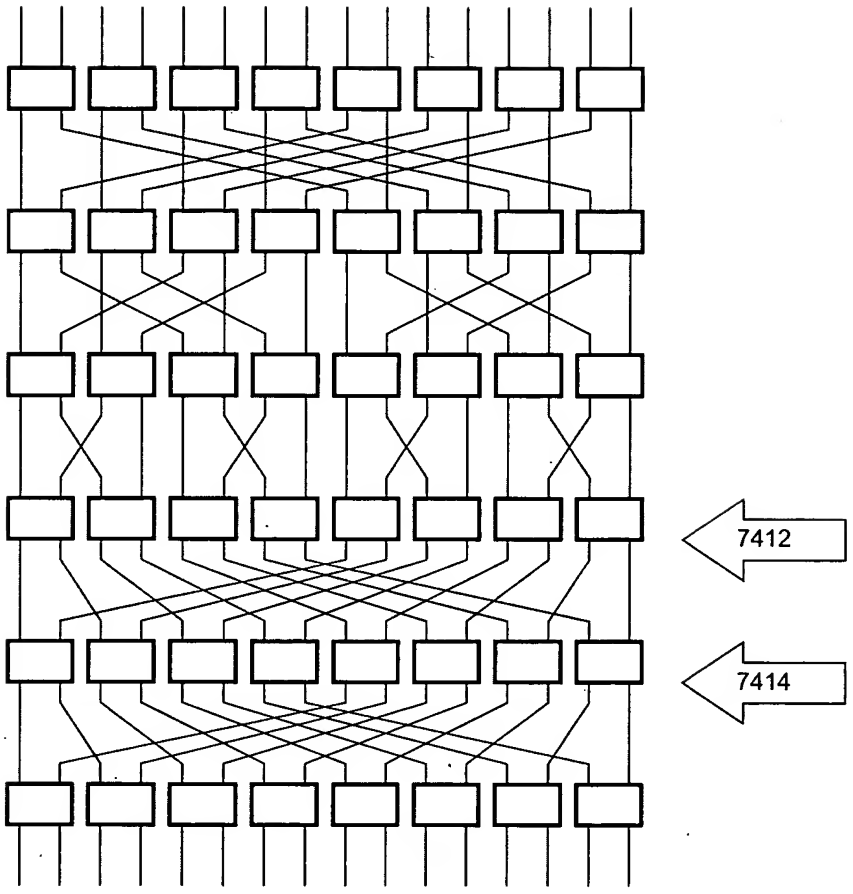

FIG. 84C

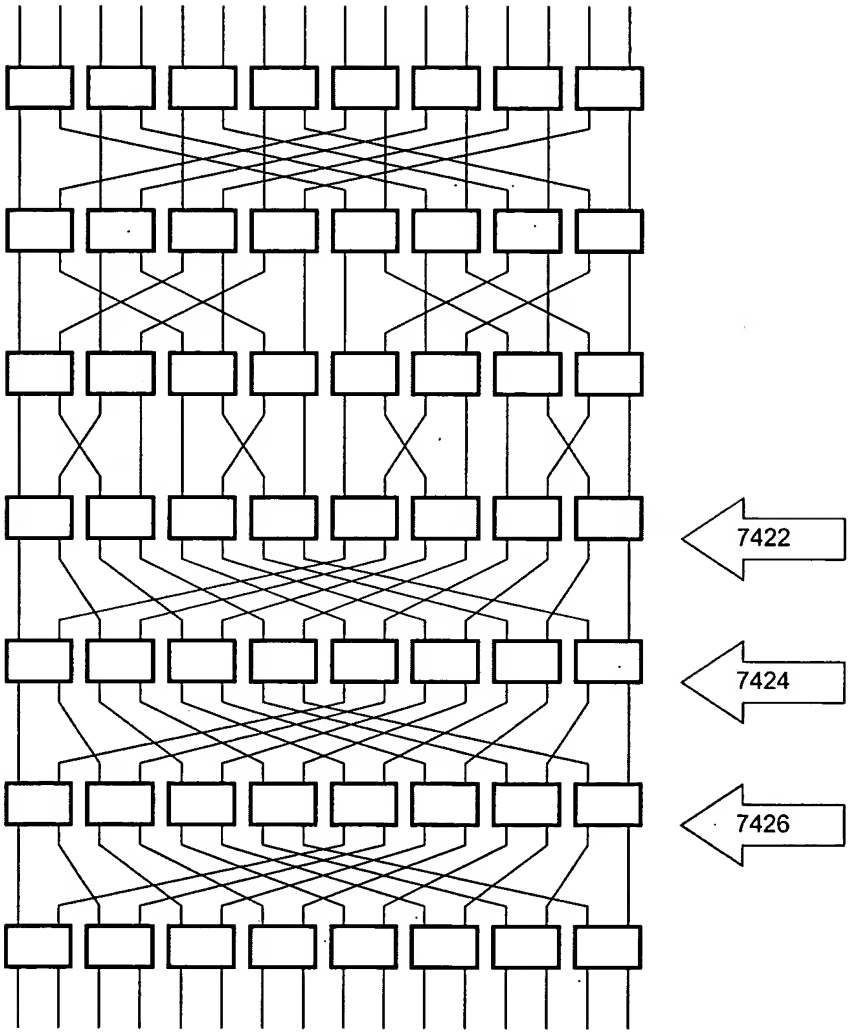

FIG. 84D

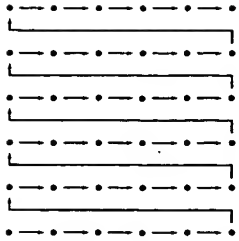

FIG. 85A

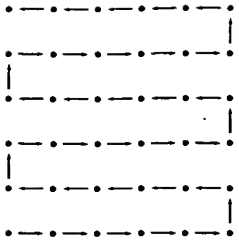

FIG. 85B

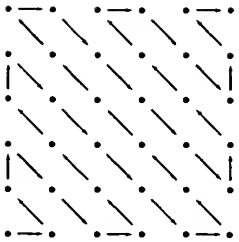

FIG. 85C

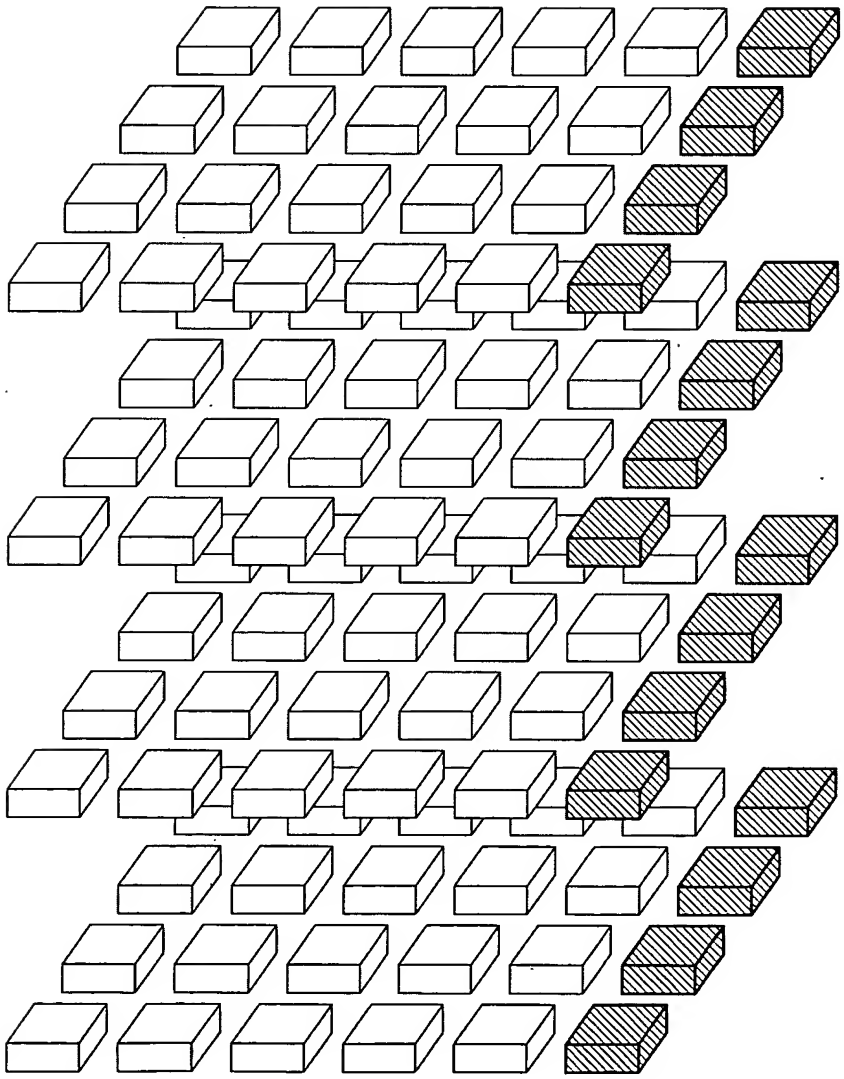

FIG. 86A

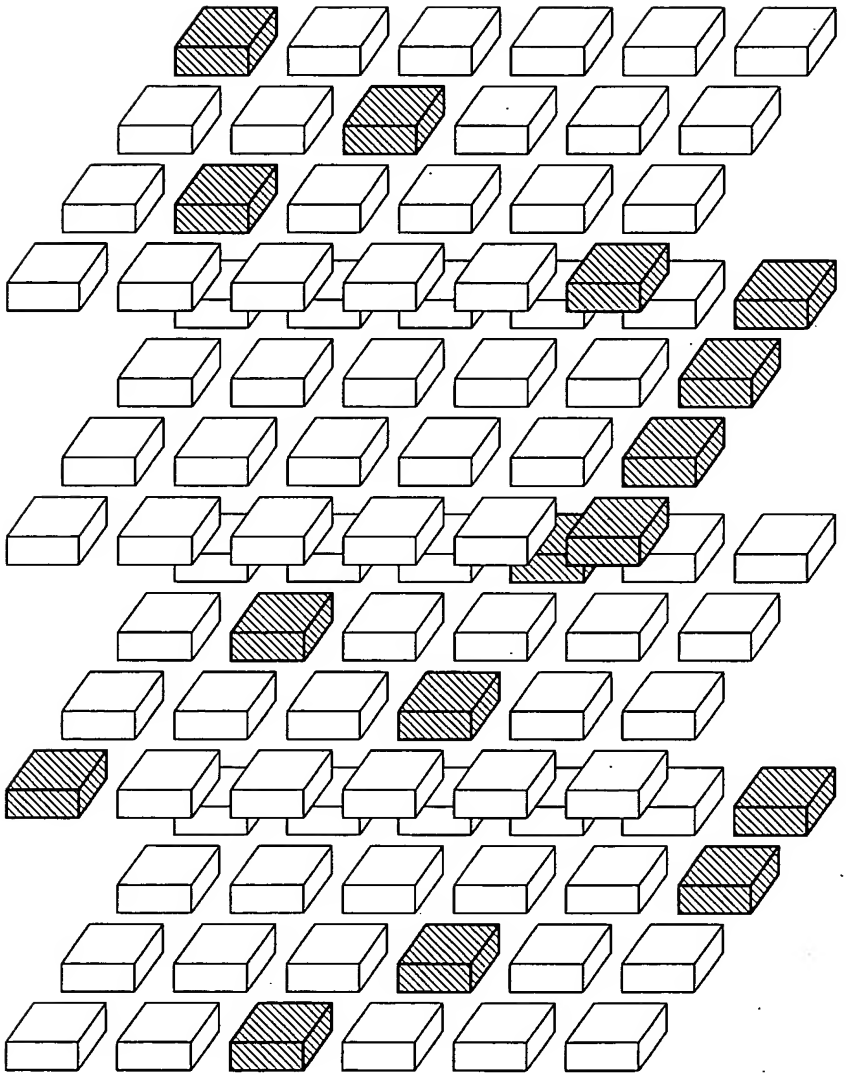

FIG. 86B

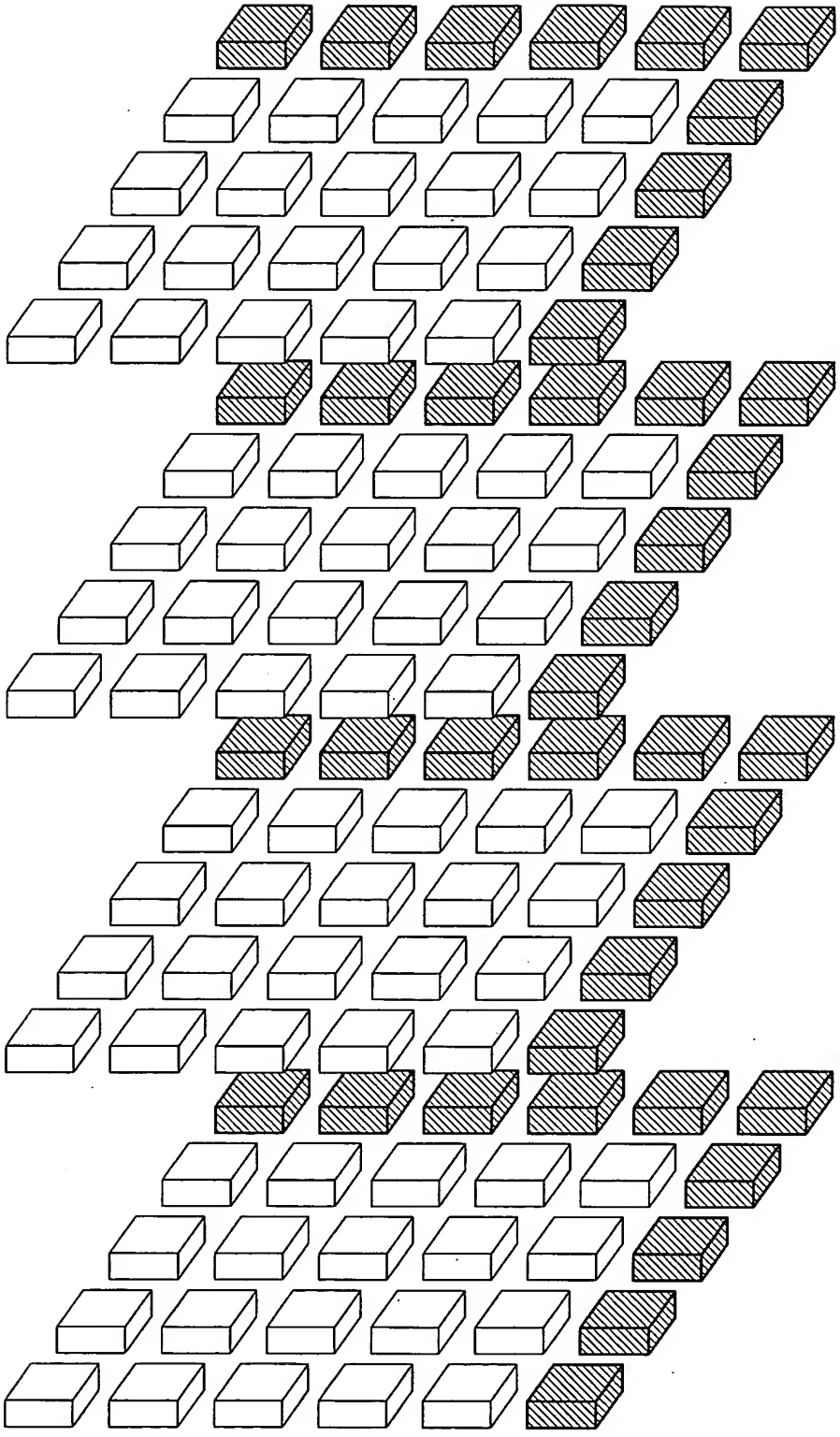

FIG. 86C

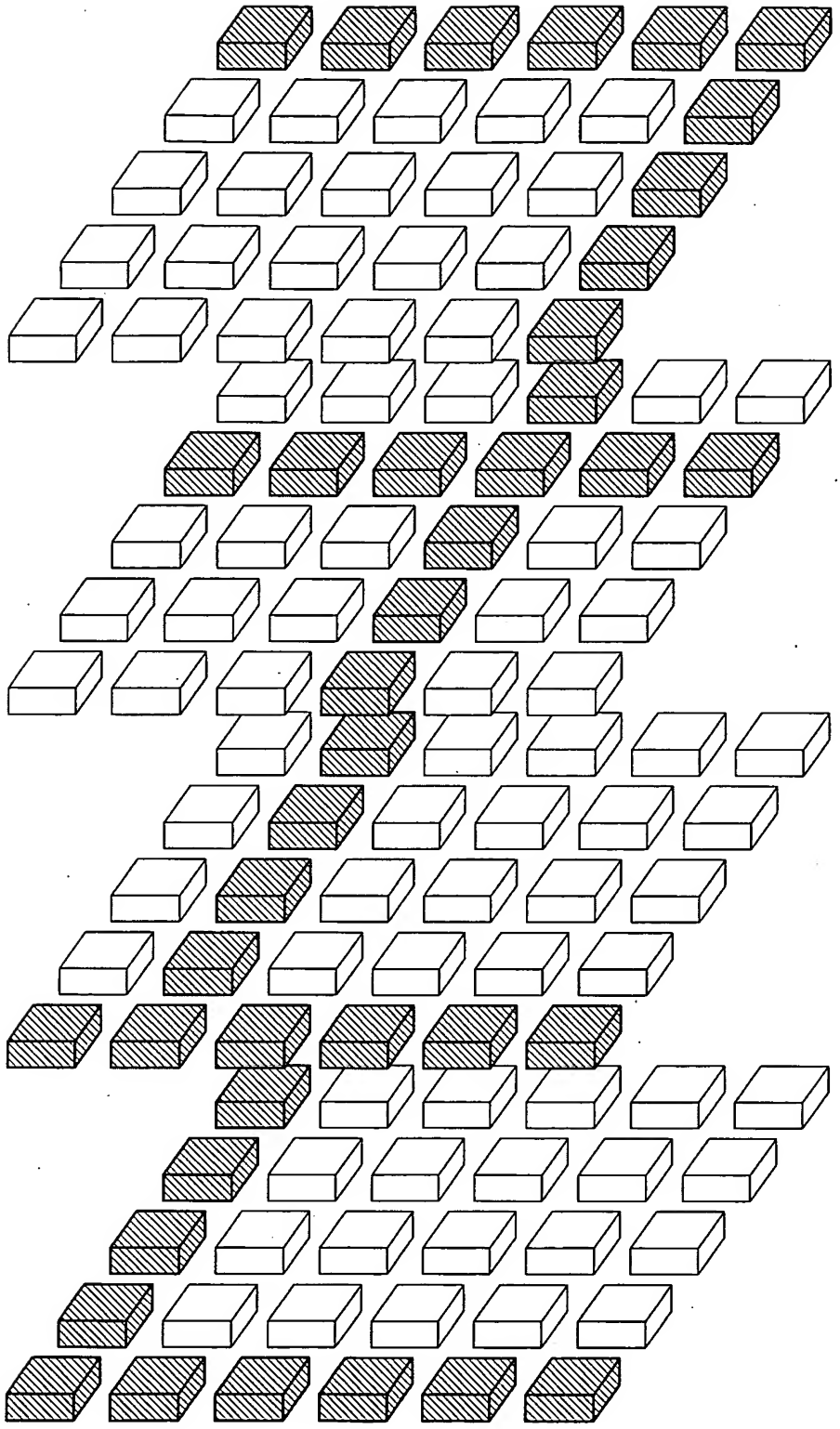

FIG. 86D

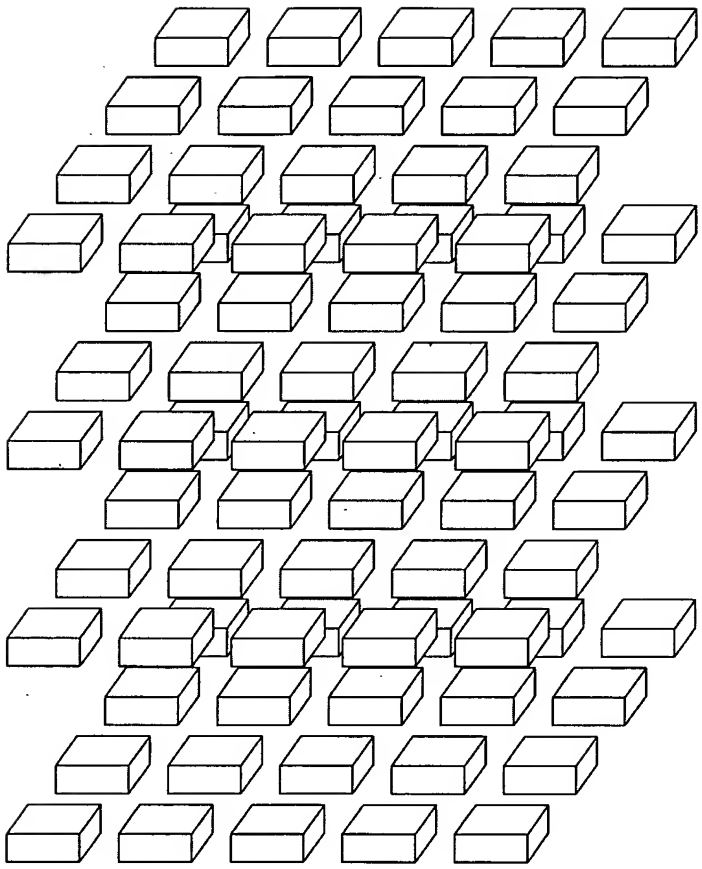

FIG. 87A

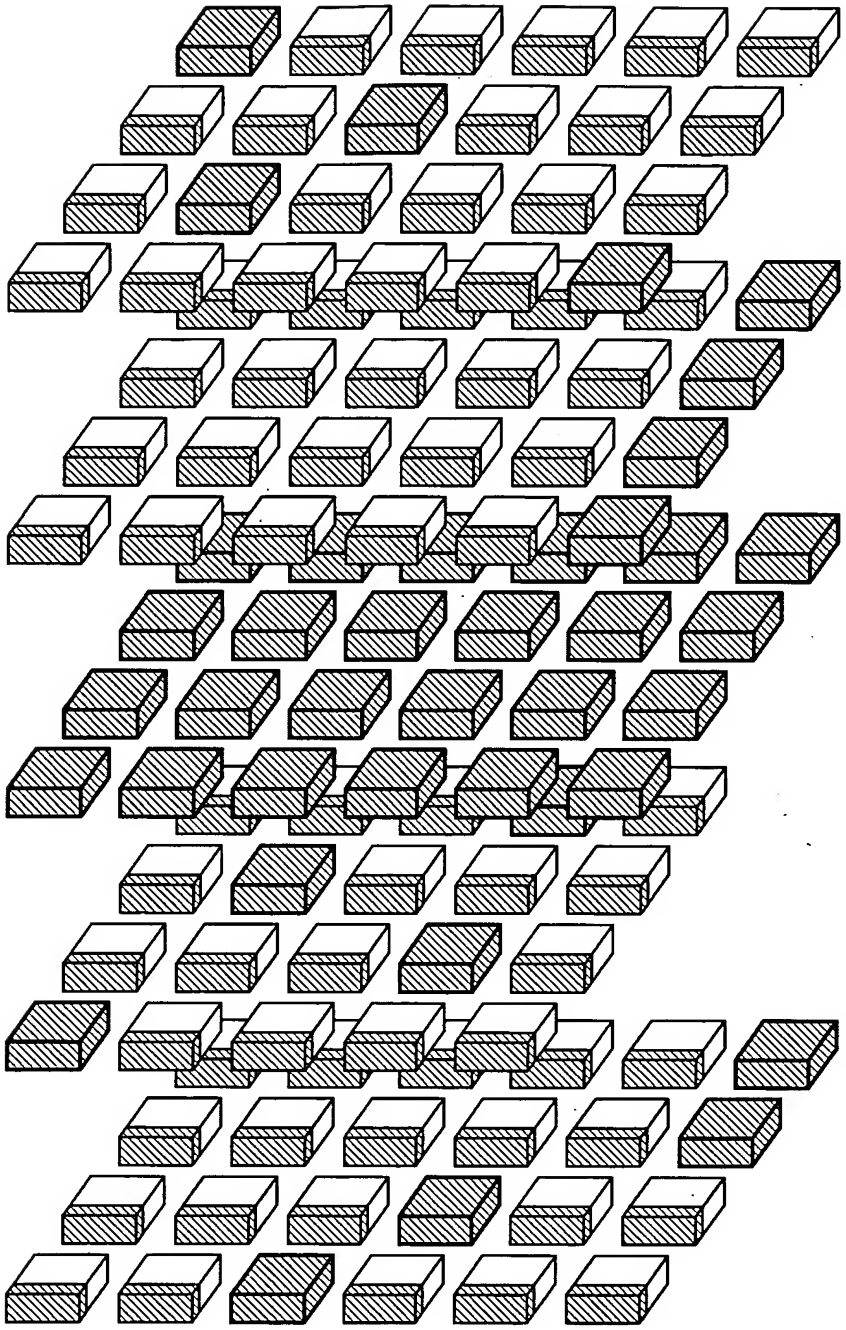

FIG. 87B

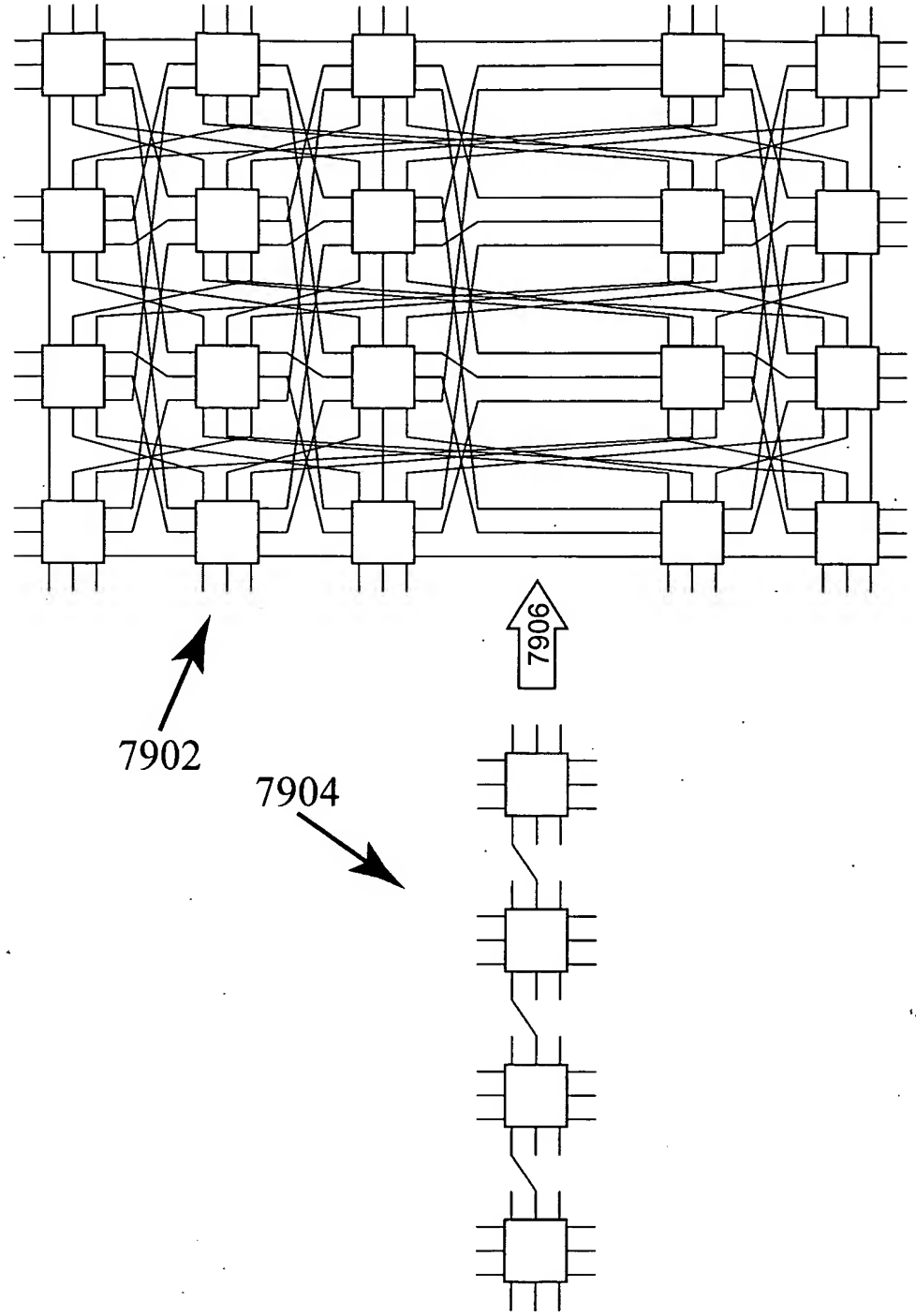

FIG. 88A

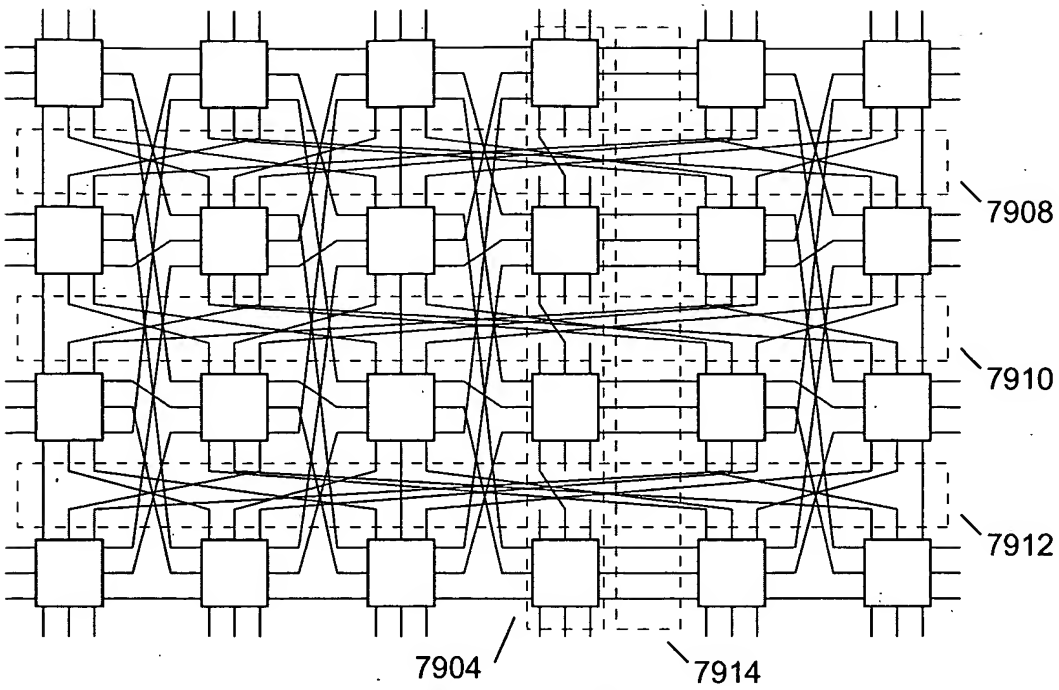

FIG. 88B

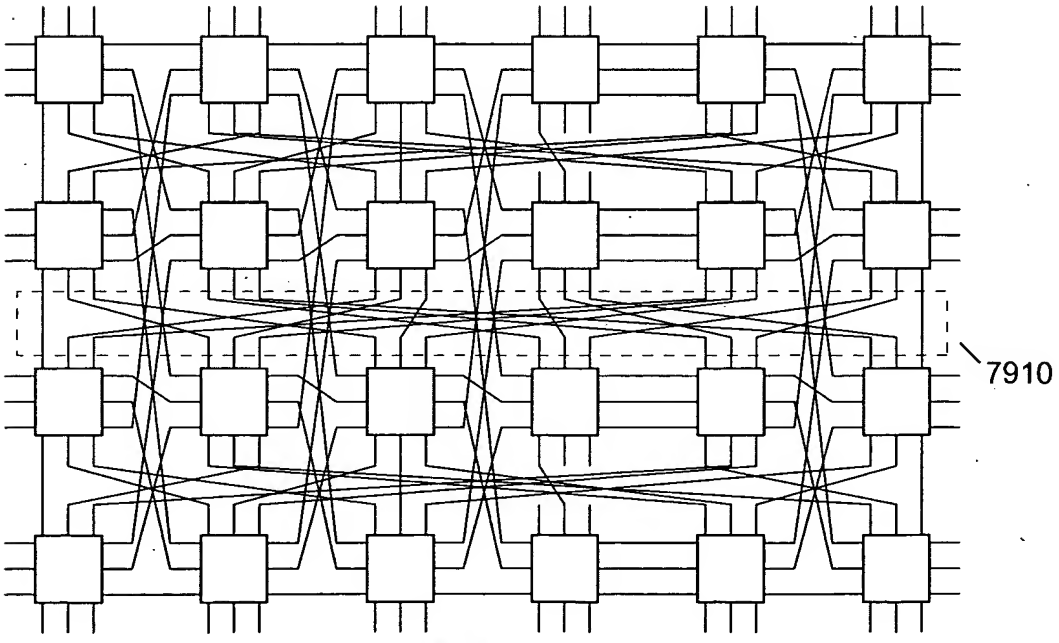

FIG. 88C

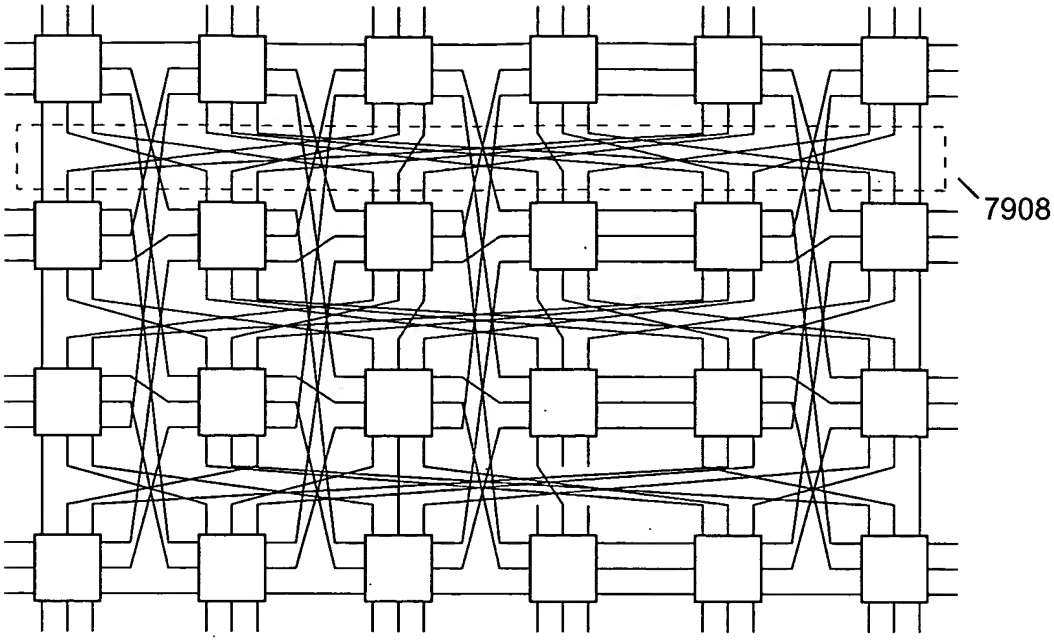

FIG. 88D

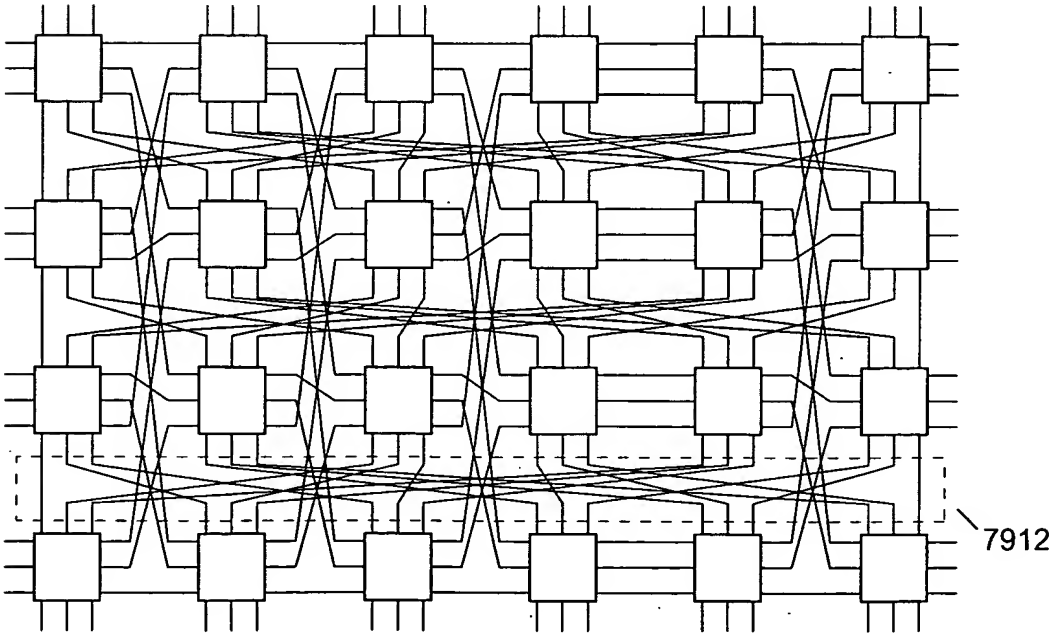

FIG. 88E

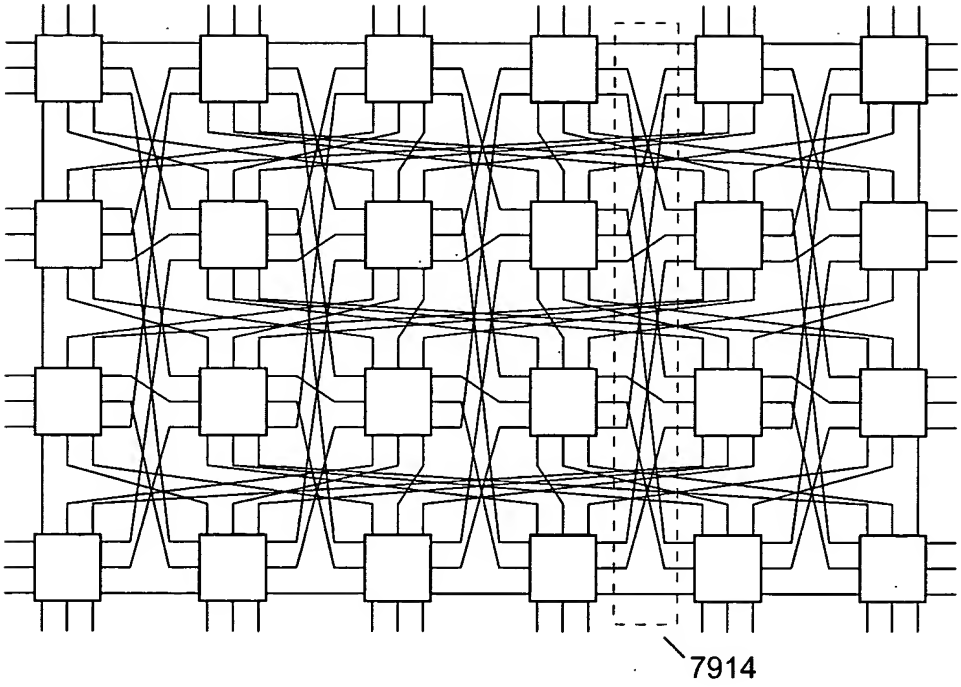

FIG. 88F

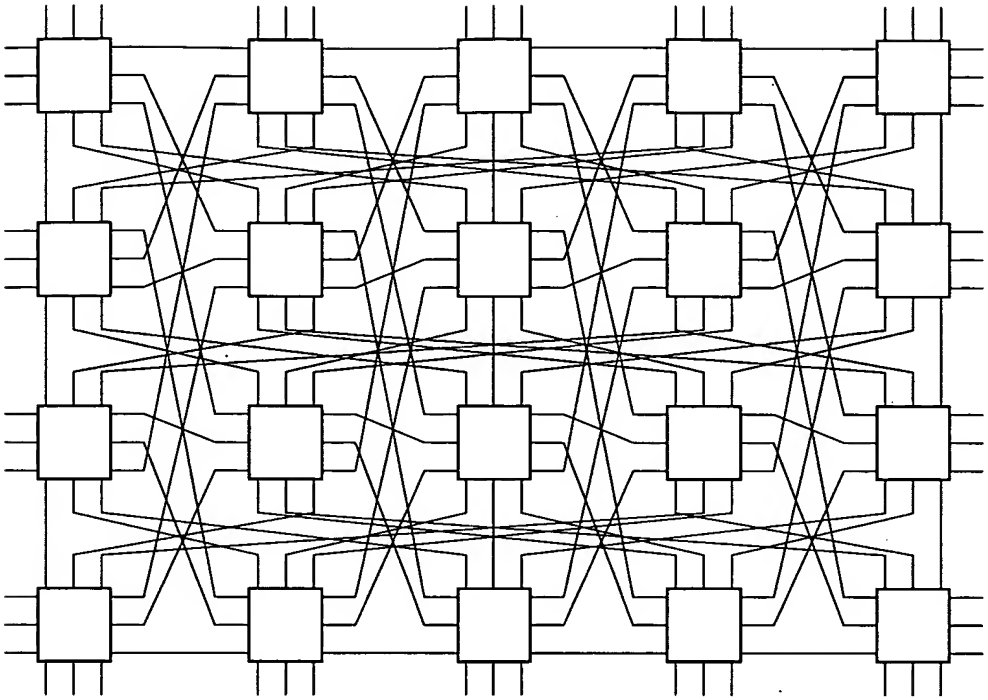

FIG. 89A

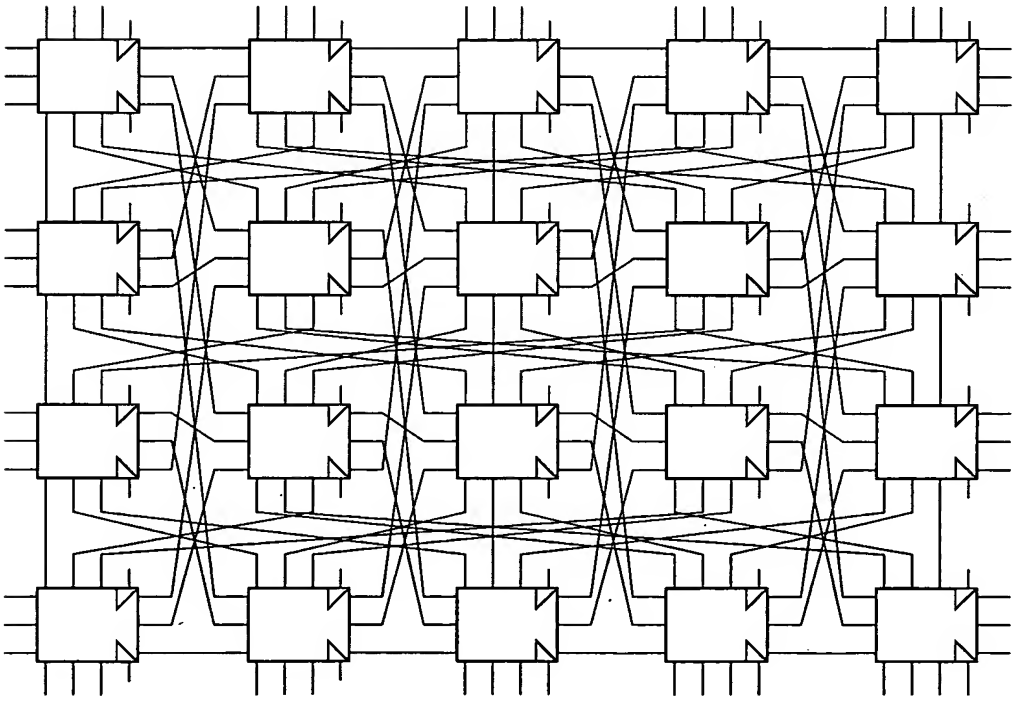

FIG. 89B

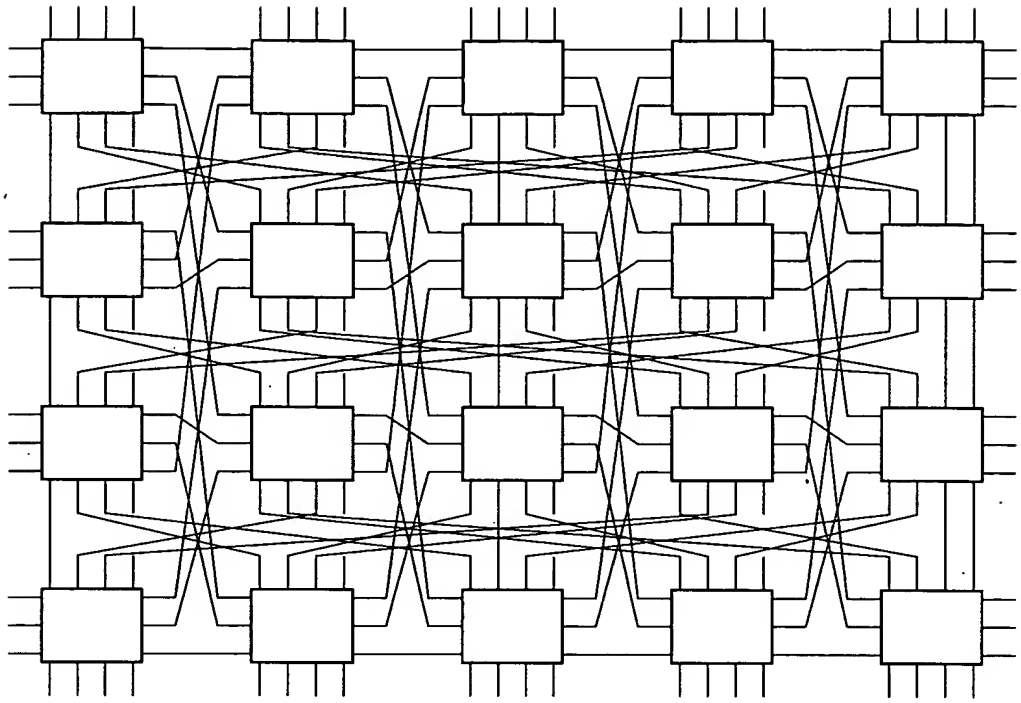

FIG. 89C

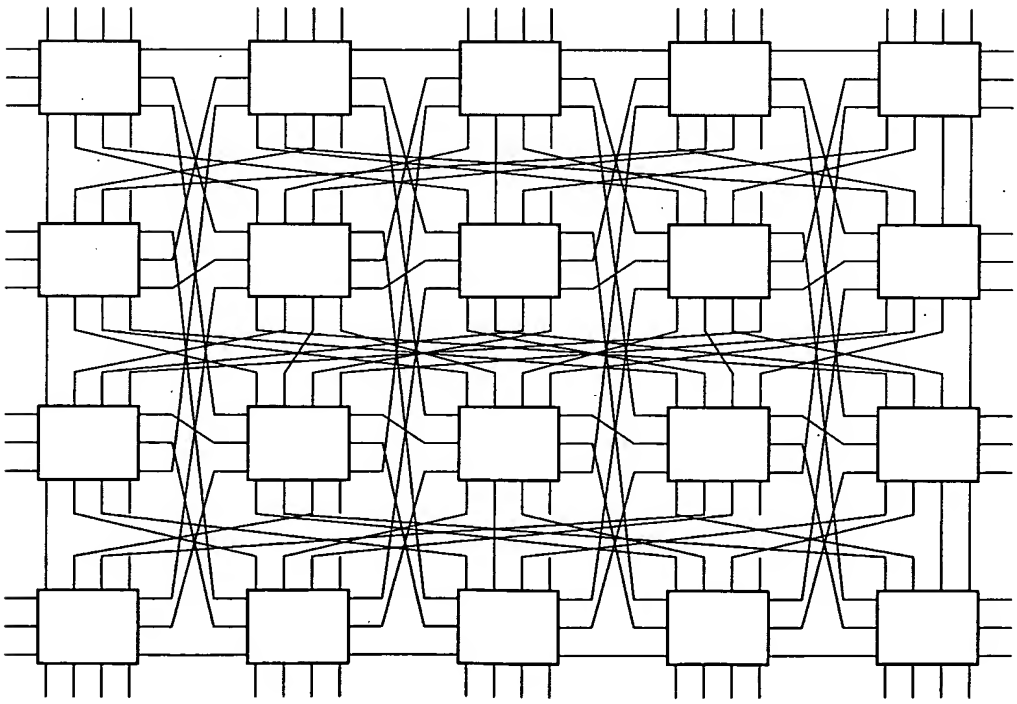

FIG. 89D

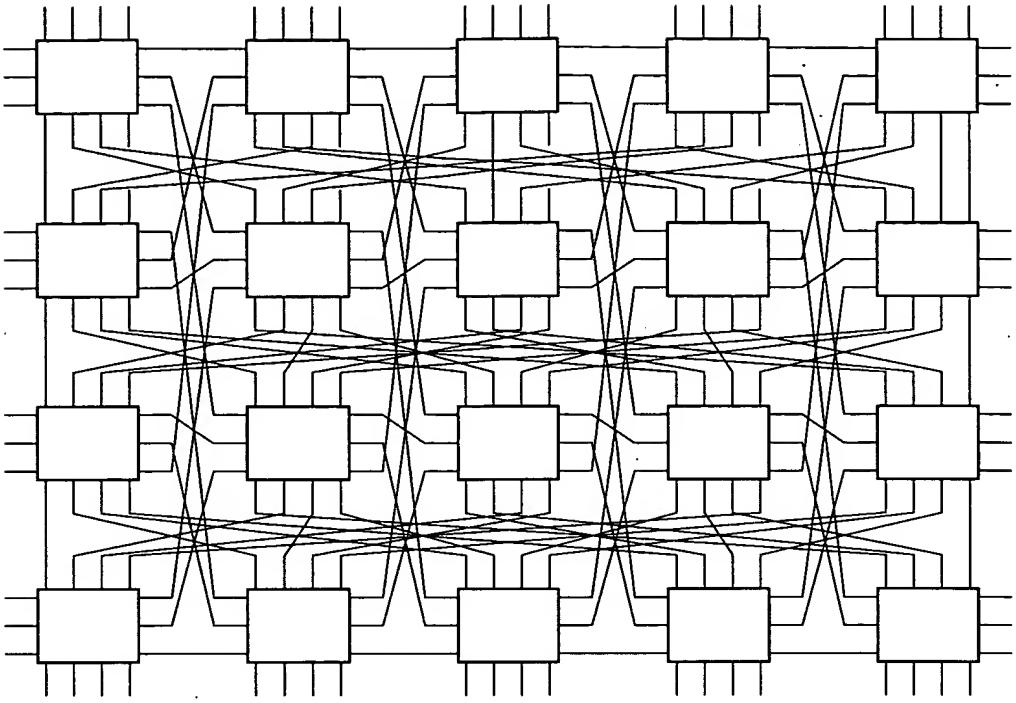

FIG. 89E

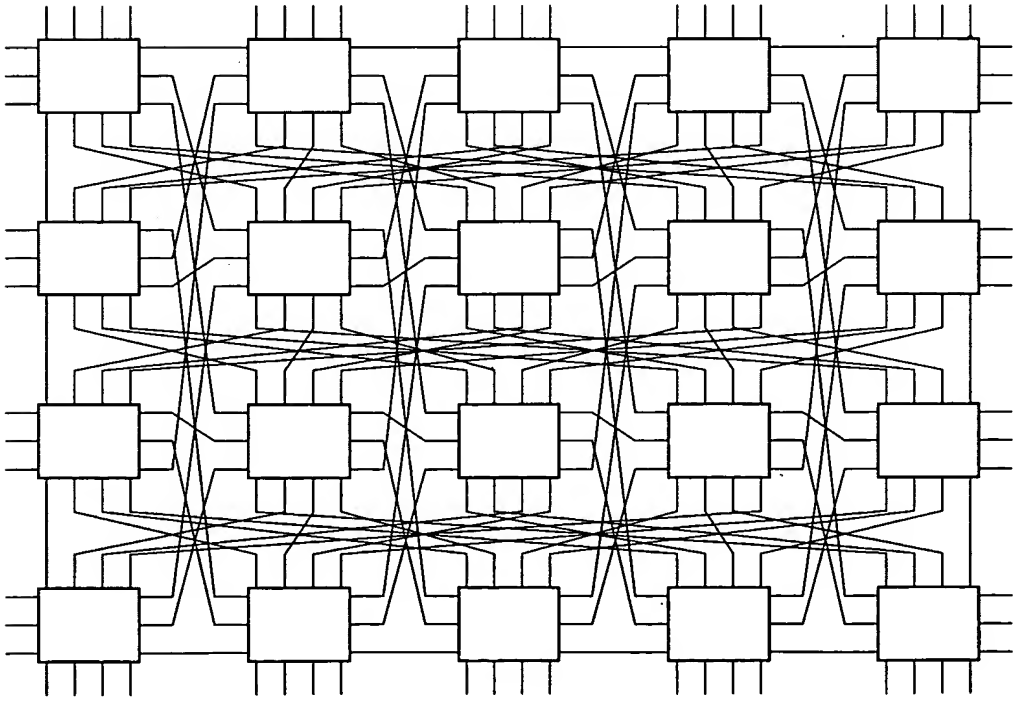

FIG. 89F

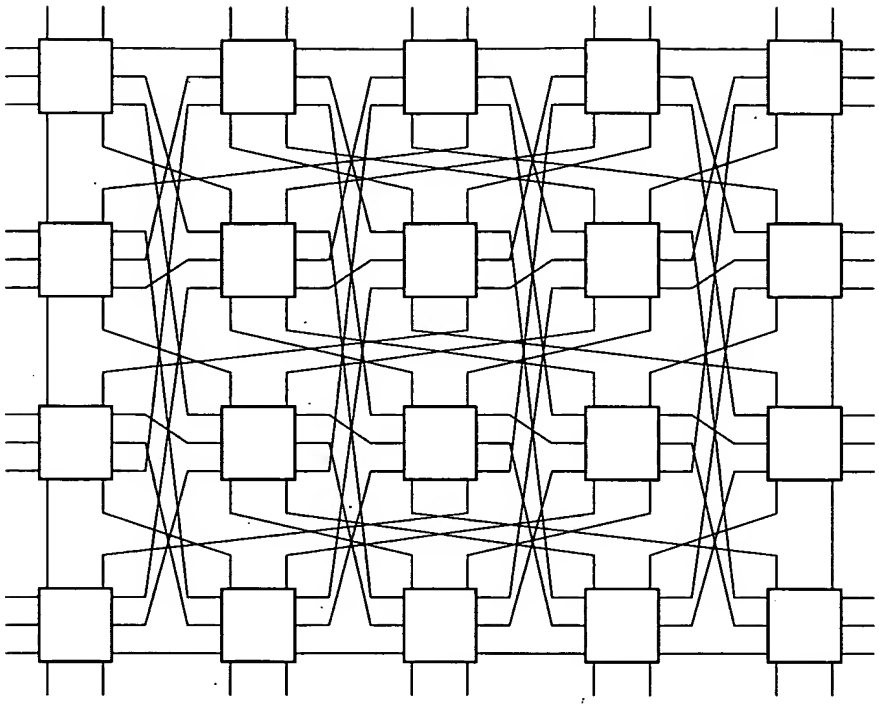

FIG. 90A

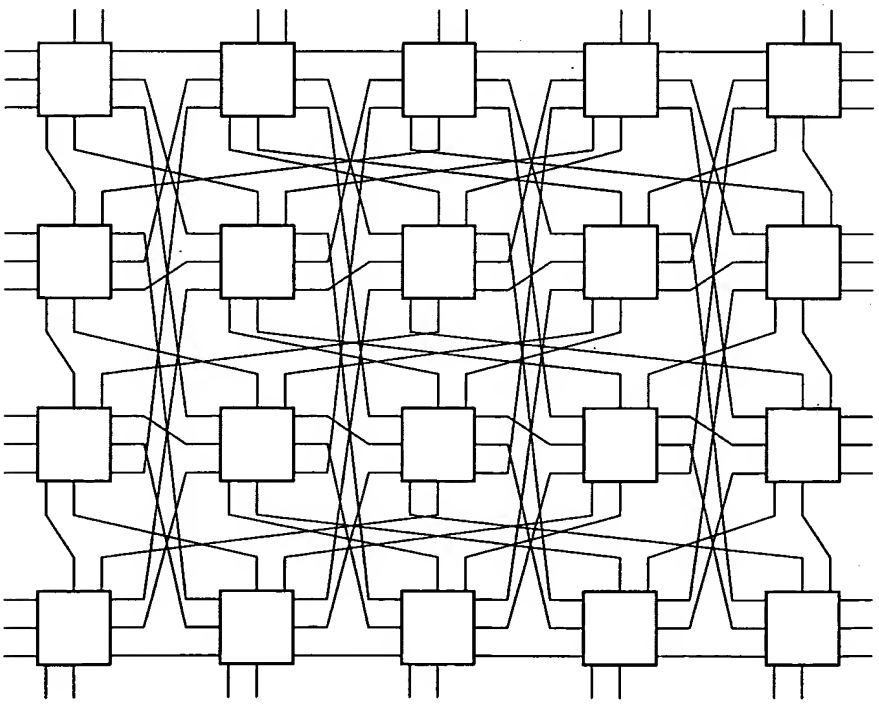

FIG. 90B

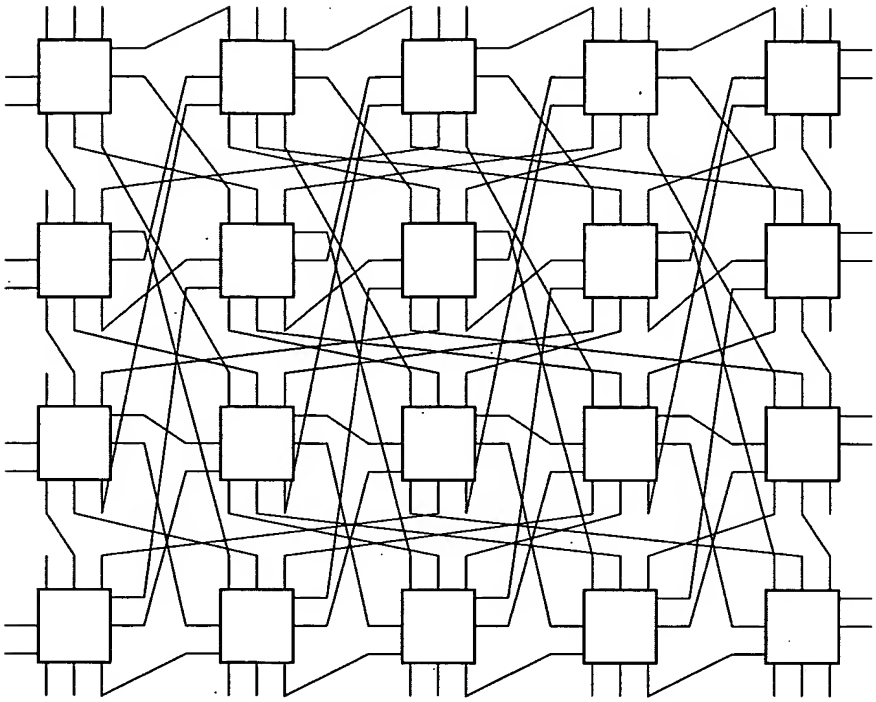

FIG. 90C

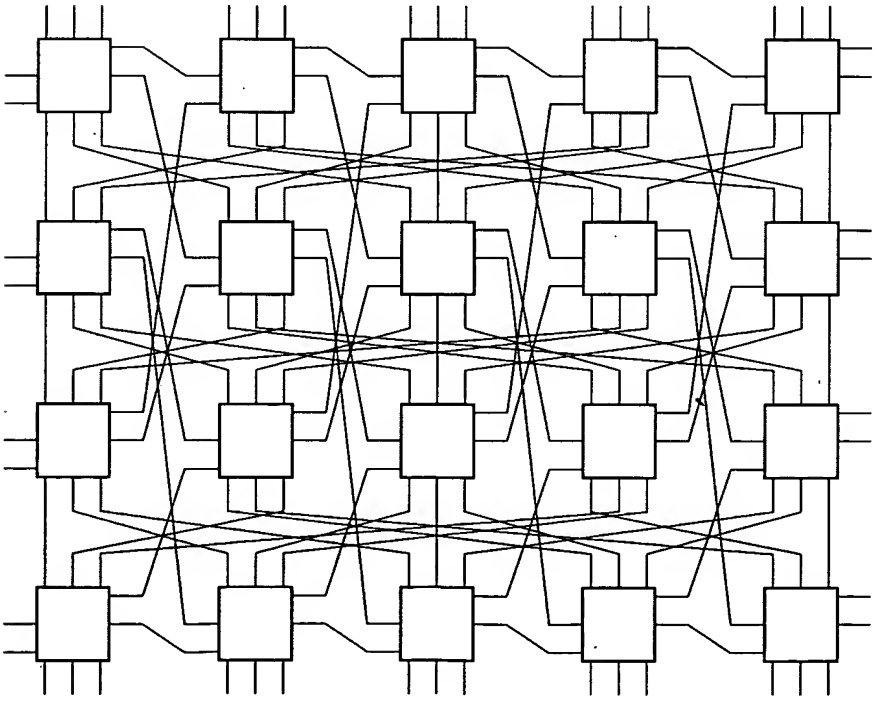

FIG. 90D

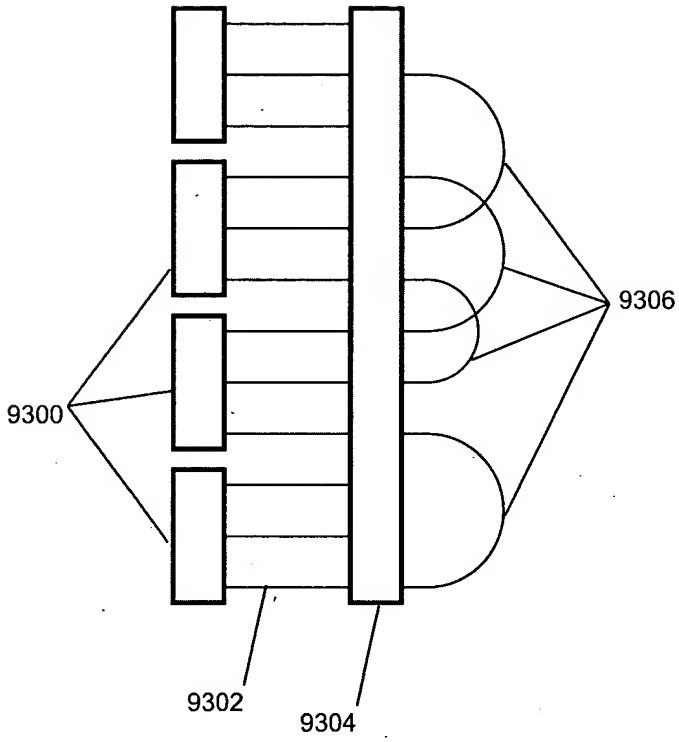

FIG. 91

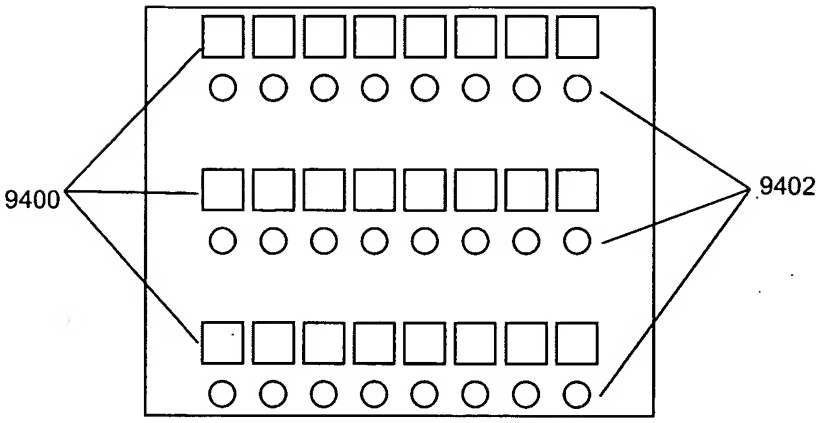

FIG. 92

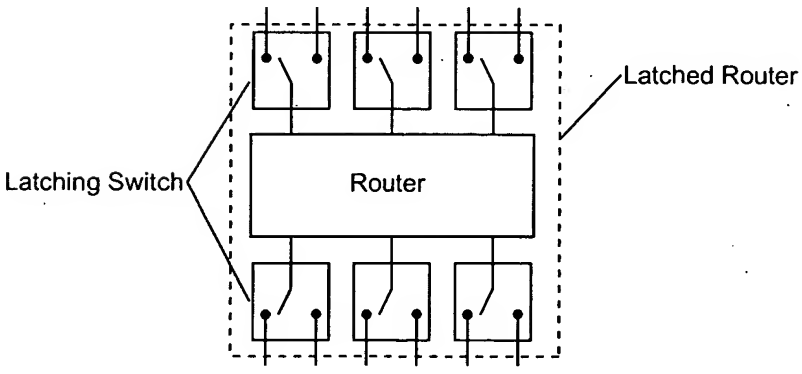

FIG. 93

```
repeat until done {
     determine next connection to be established;
     if a completely new connection is to be made between two vacant ports {
          indicate both port lights with "connect";
          wait until technician has made the connection;
          verify correct connection is made, otherwise indicate "error" on both ports;
     } else {
          if connection needs to be broken select a port to disconnect {
               indicate the light for desired port to "disconnect";
               wait until technician has disconnected the connector;
               if technician disconnected wrong port indicate "error" at the port disconnected;
          }
          if connection can be made {
               indicate port light to be connected with "connect";
               wait until technician has made the connection;
               verify correct connection is made, otherwise indicate "error" on that port;
          }
     }
}
```

FIG. 94

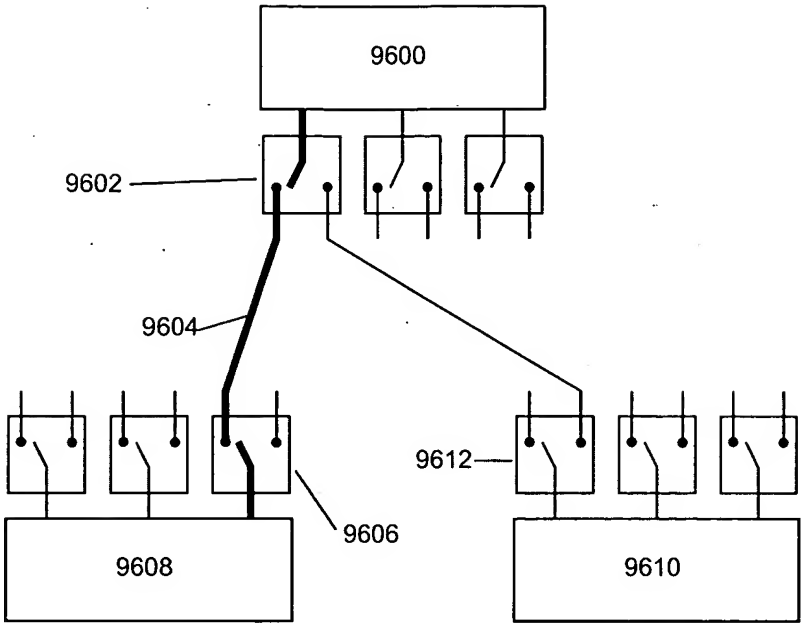

FIG. 95A

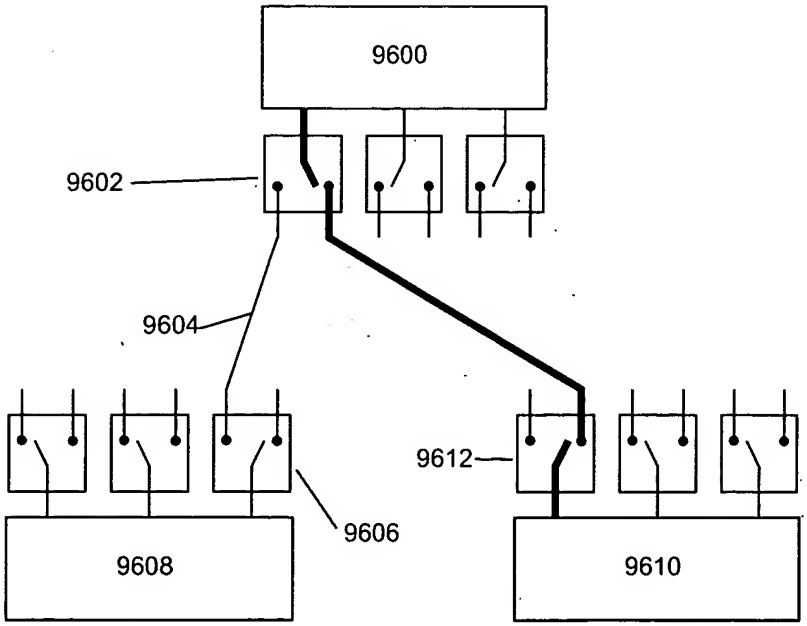

FIG. 95B

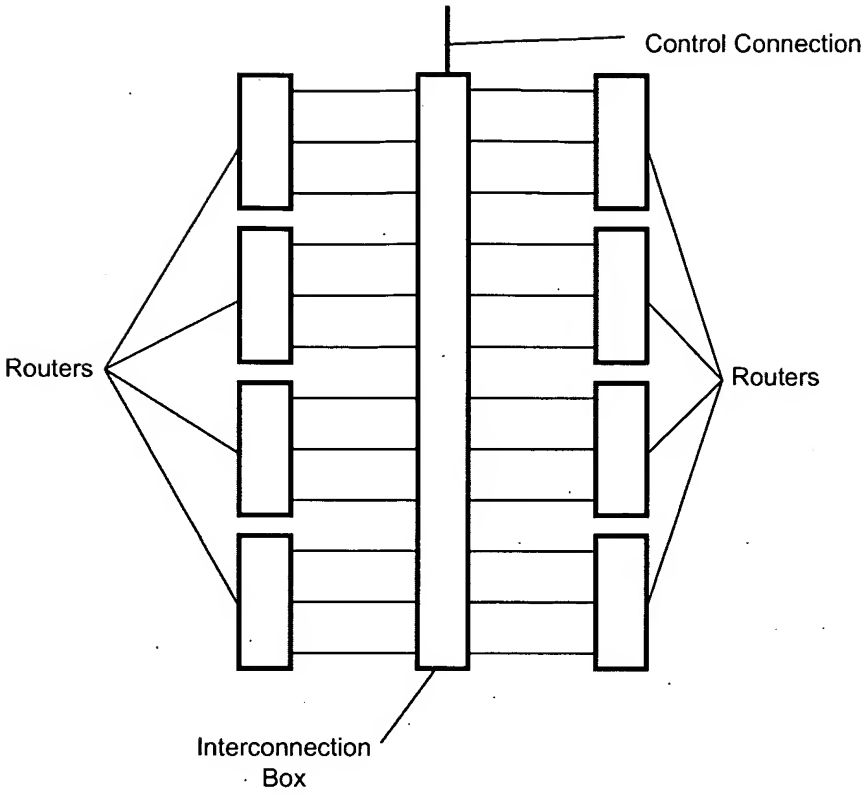
Control Connection
Routers
Routers
Interconnection
Box

FIG. 96

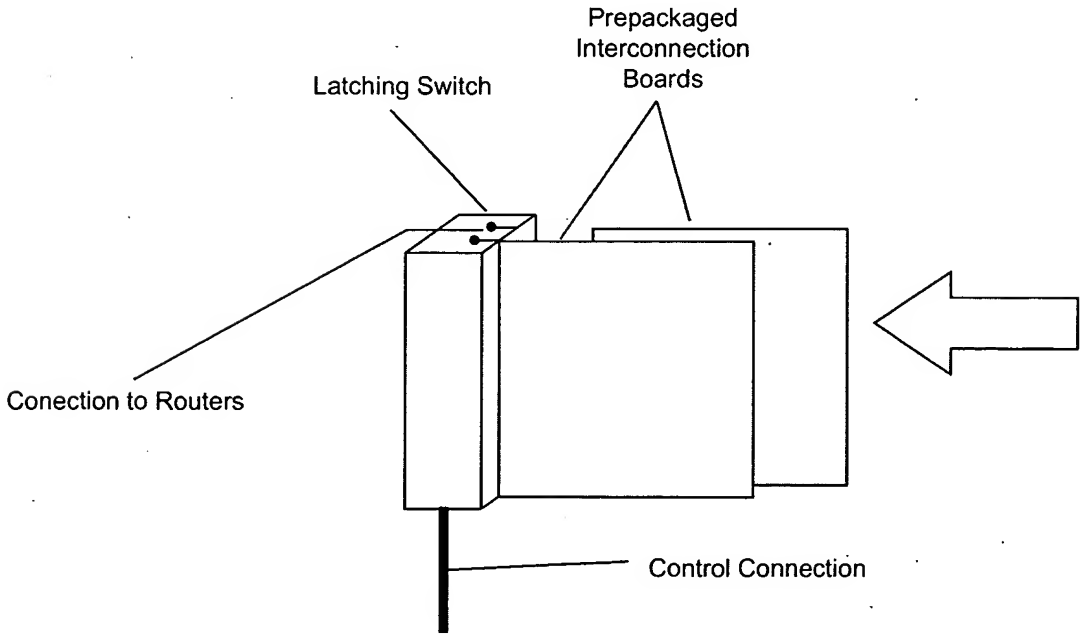
Prepackaged
Interconnection
Boards
Latching Switch
Conection to Routers
Control Connection

FIG. 97

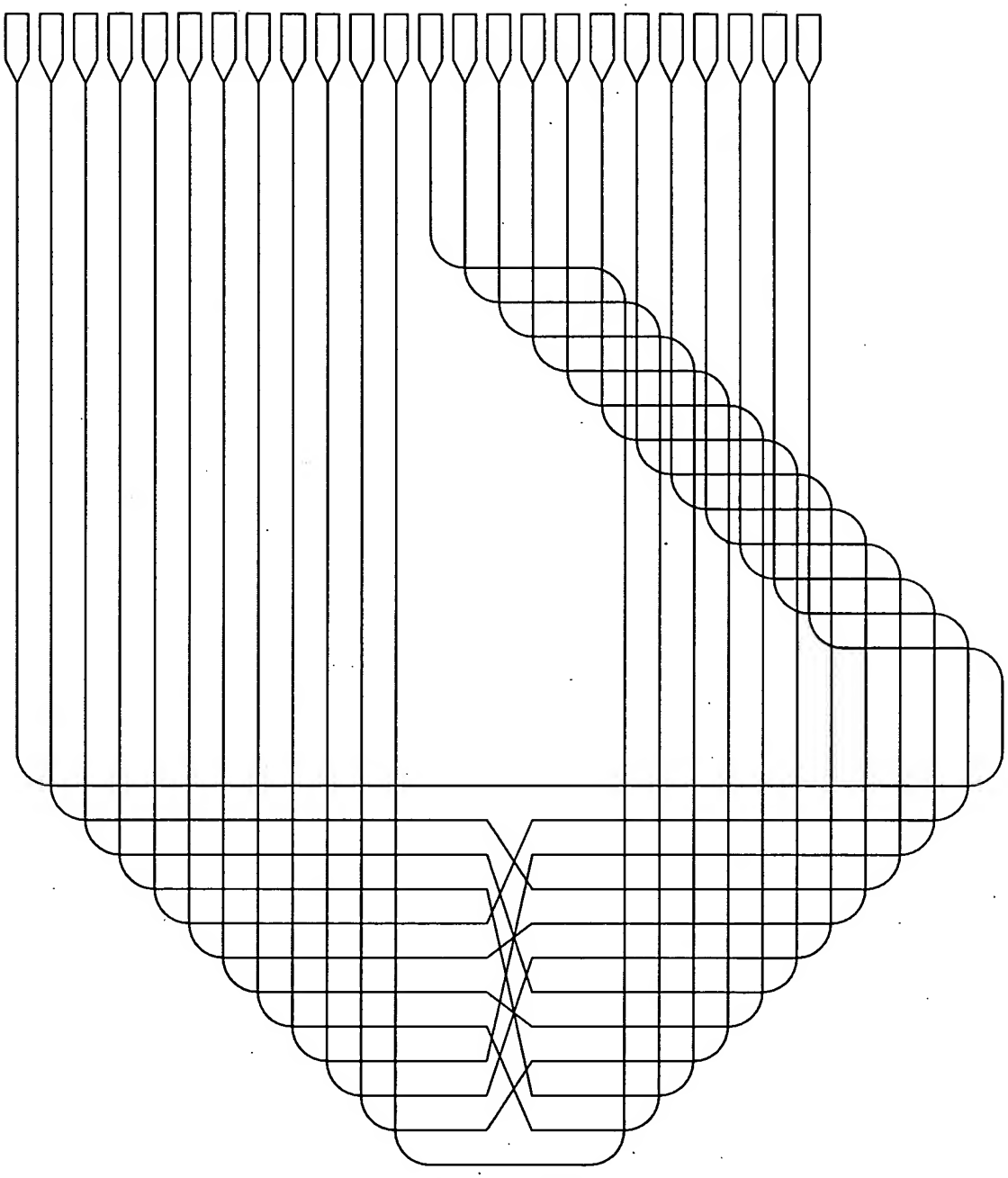

FIG. 98

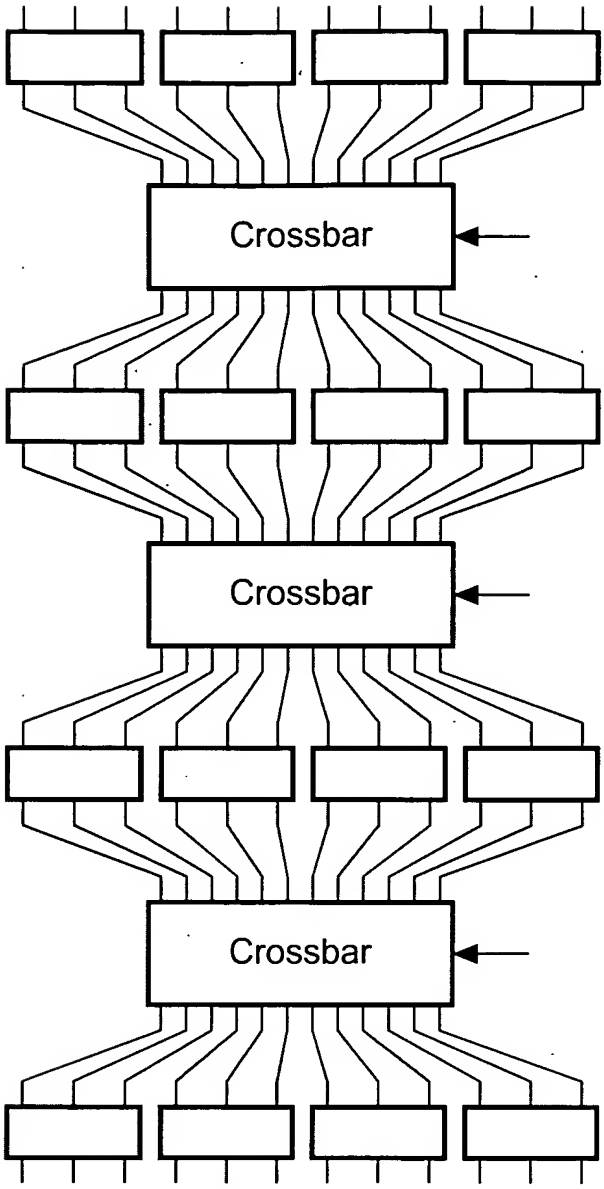

FIG. 99

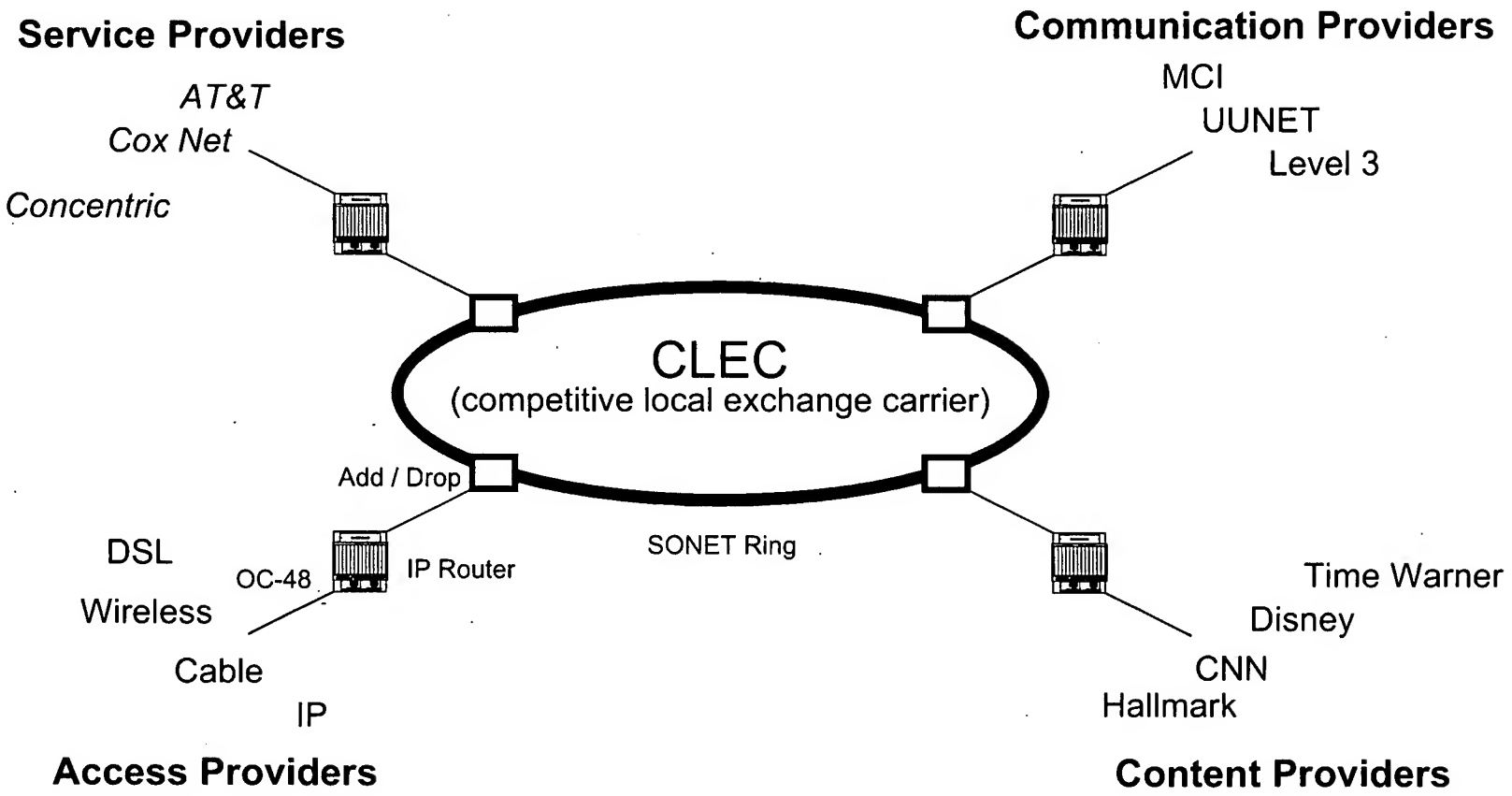
Service Providers
AT&T
Cox Net
Concentric
Communication Providers
MCI
UUNET
Level 3
CLEC
(competitive local exchange carrier)
Add / Drop
SONET Ring
DSL
OC-48
IP Router
Wireless
Cable
IP
Time Warner
Disney
CNN
Hallmark
Access Providers
Content Providers

FIG. 100A

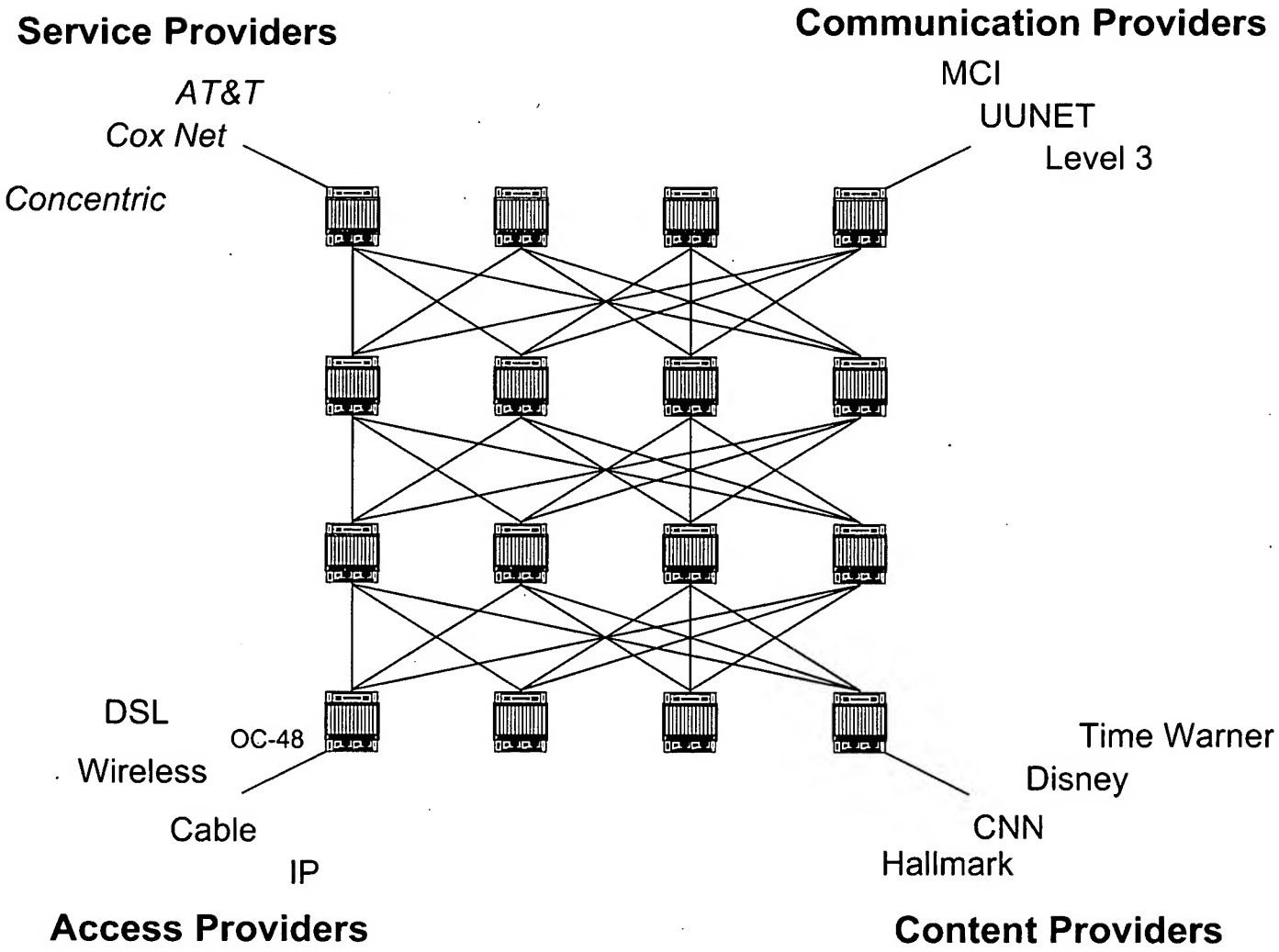
Service Providers
AT&T
Cox Net
Concentric
Communication Providers
MCI
UUNET
Level 3
DSL
OC-48
Wireless
Cable
IP
Time Warner
Disney
CNN
Hallmark
Access Providers
Content Providers

FIG. 100B

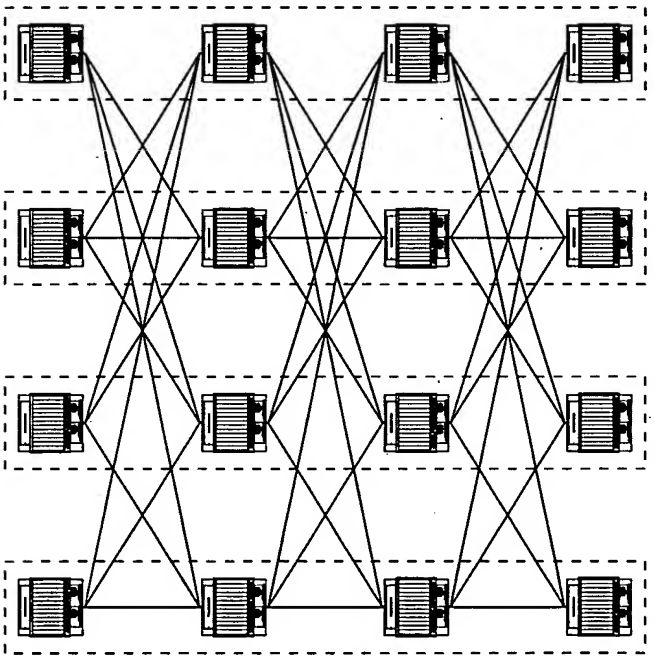

FIG. 100C

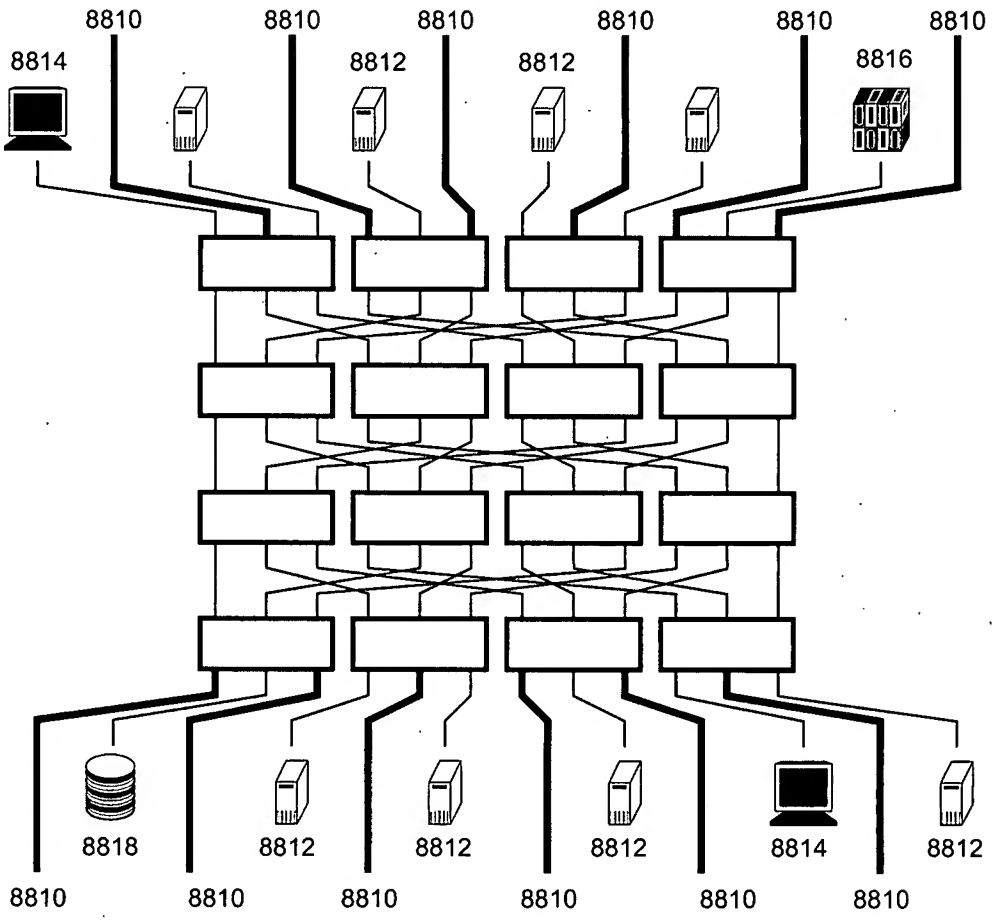
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FIG. 101

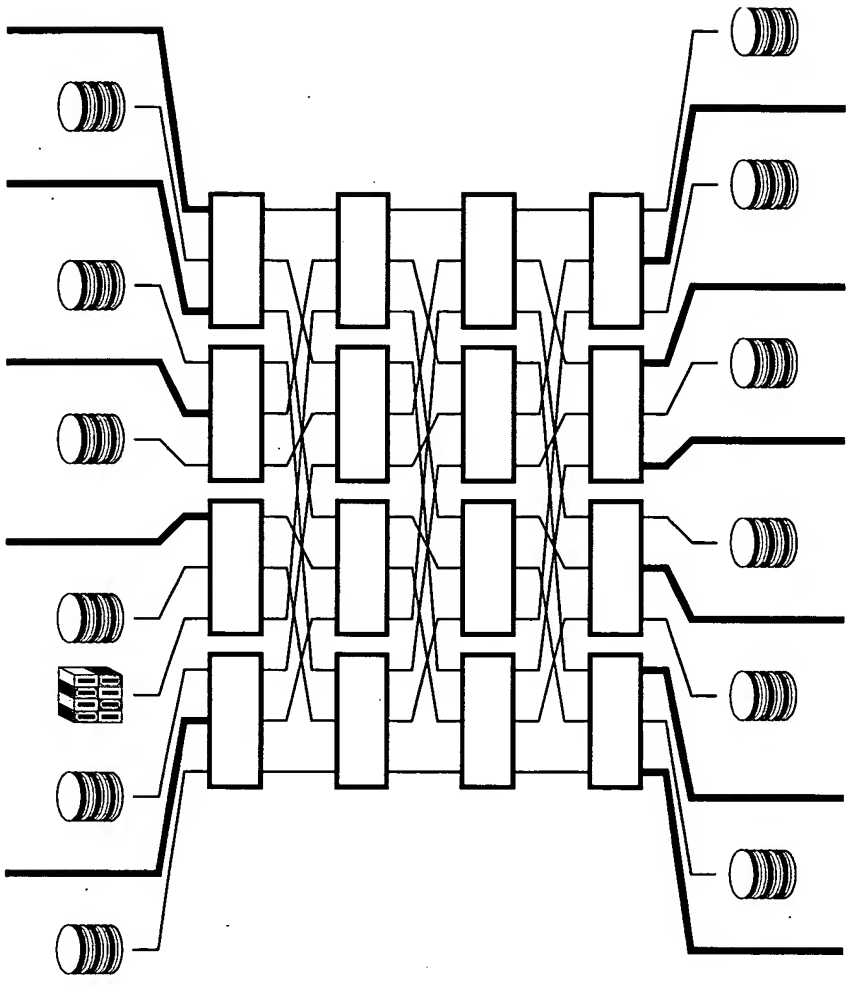

FIG. 102A

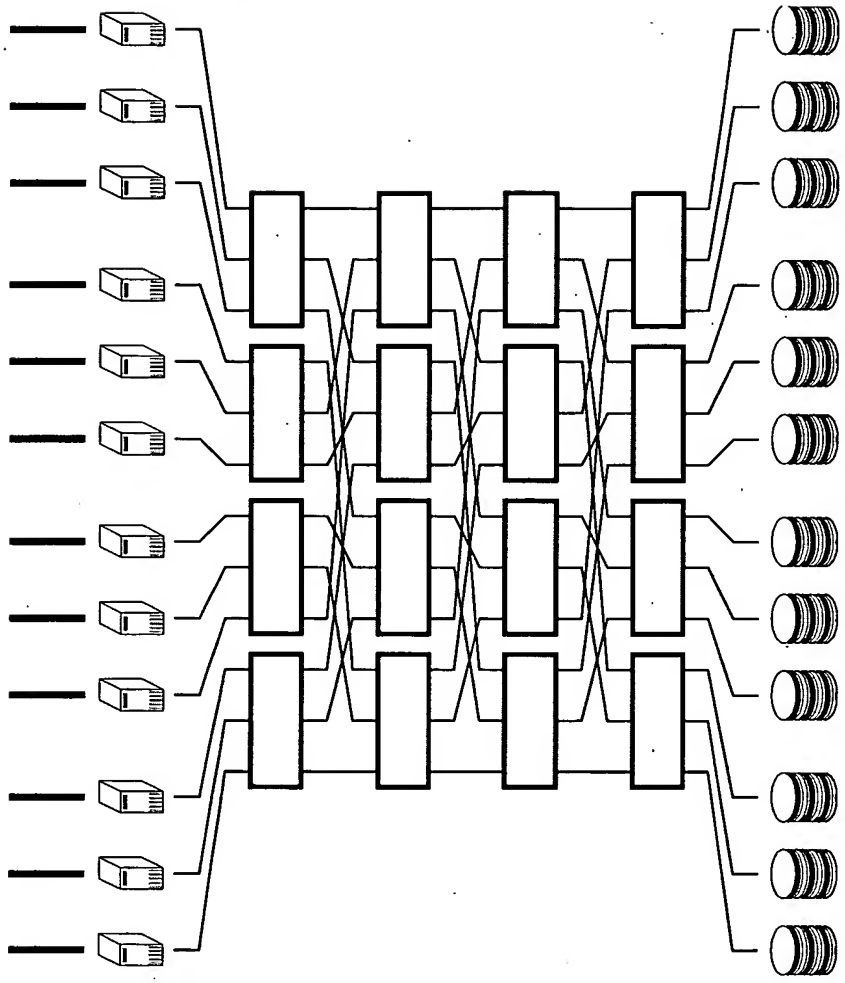

FIG. 102B

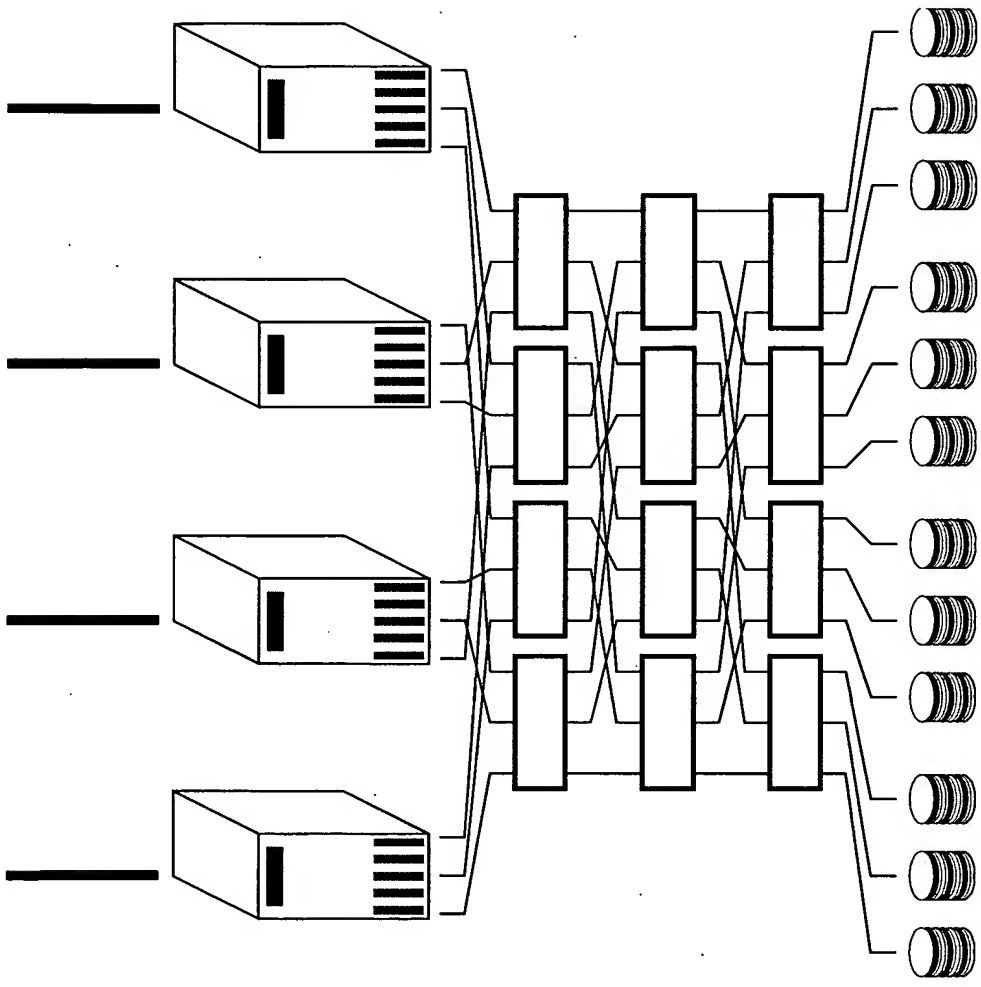

FIG. 102C

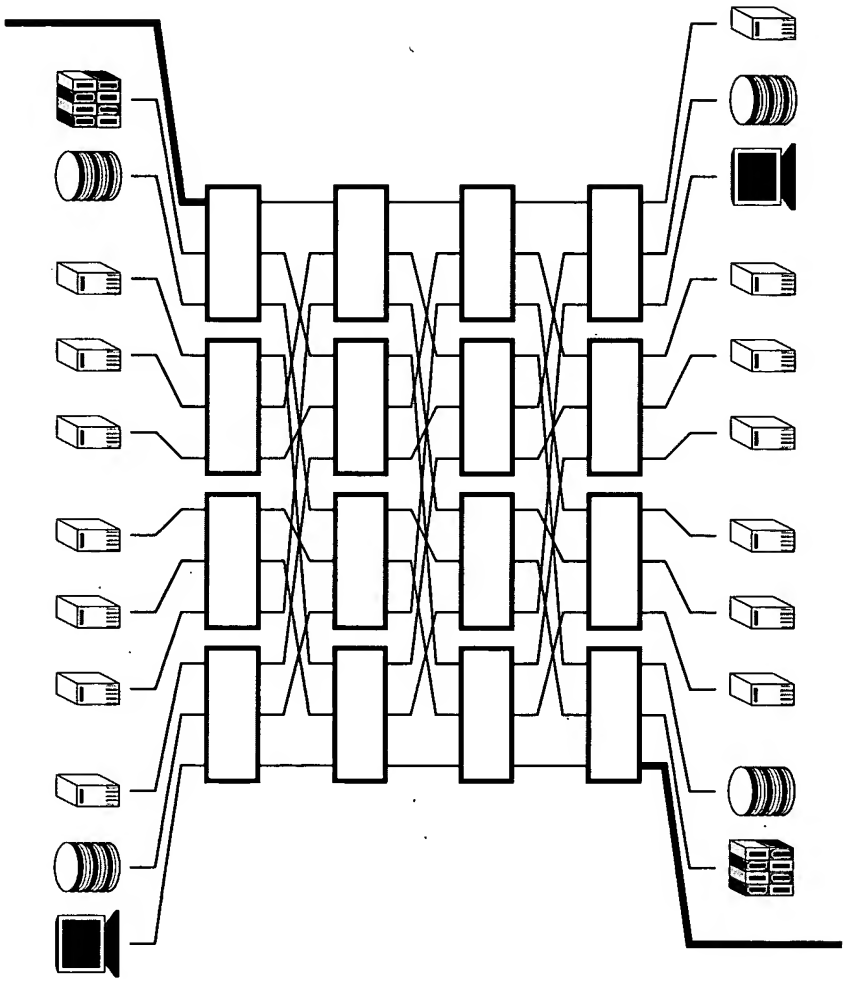

FIG. 103

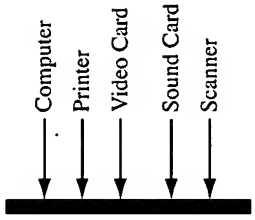

FIG. 104A

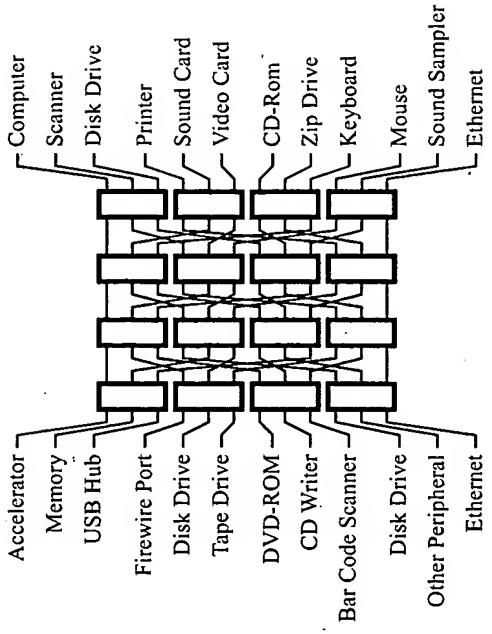

FIG. 104B

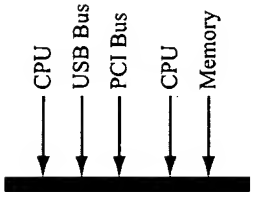

FIG. 105A

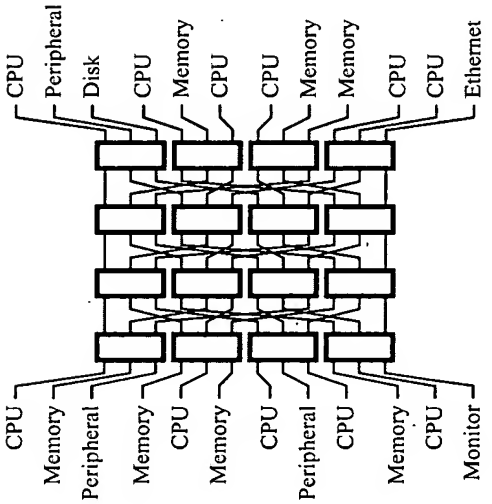

FIG. 105B